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INTRADERMAL TEST FOR VITAMIN C NUTRITION OF THE BODY IN OPHTHALMIC PATIENTS

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Numerous reports and researches published during the last three years indicate the growing realisation of the important role of vitamin C in the ophthalmic conditions. The chief lines of enquiry are the studies on the ascorbic acid content as well as vitamin C metabolism of aqueous humor and crystalline lens in normal adults and in cataract patients; and the preventive and therapeutic role of vitamin C in incipient and well established cases of cataract.

In the course of a series of investigations on the intradermal test as an index of vitamin C nutrition of the body, we had an opportunity of collecting data on the clinical condition and dietetic habits of patients attending the ophthalmic department for a variety of eye diseases and performing the intradermal test on them.

An intradermal test for assessing the state of vitamin C nutrition of the human body was first described by Rotter (1937) using the dye 2-6 dichlorophenol indophenol. Rotter stated that the decolourisation time of the dye was a fair index of the vitamin C status of the body. If it was less than 5 minutes, the person was saturated; if the time ranged between 5 and 10 minutes, the person was said to be normal. If time was prolonged beyond 10 minutes, the individual was considered to be suffering from a deficiency of vitamin C.

His work was confirmed by Portnoy and Wilkinson (1938). Recently, Banerjee and Guha (1939, 1940) have experimentally demonstrated the correlation between the amount of vitamin C ingested and the decolorisation time of the intradermal test. They noted that both in guineapigs and human beings, the decolorisation time became shorter and shorter with increasing saturation with vitamin C.

The actual technique adopted was that of Portnoy and Wilkinson. A small drop of 2-6 dichlorophenol indophenol is injected intradermally, so as to raise a small wheal (2 m.m. in diameter) and the time taken for the colour to disappear is noted by means of a stop-watch. An area on the volar aspect of the forearm, free from hair and veins, was selected.

The total number of patients examined was 69. Of these 30 were outdoor patients and 39 indoor patients. The great majority were adults and males.

Relevant data and results are grouped in Table I.

In the first group, namely, the 30 outpatients (Ref. Table II and I), only two persons gave history of bleeding from the gums. All the rest stated that they were healthy and showed no appreciable disease, except the eye condition. With the single exception of one girl, all other patients were not taking any citreous fruits as supplement to their diets. They were, however, taking vegetables and greens, cooked.

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TABLE I.

Intradermal Test done on 30 outdoor and 39 indoor patients of the Ophthalmic Department.

Group.	Nature of cases.	Number of cases.	Range of times of decolorisation of intradermal test.	Average time.	Cases showing test time within 5 minutes.	Cases showing test time between 5 & 10 min.	Cases showing test time over 10 minutes.
I	Out-door Patients suffering from various eyes conditions.	30 (15M & 15F)	3′ 0″ to 19′ 0″	8′-11″	3 (10%)	22 (73%)	5 (17%)
II A.	In-door patients:—Post operative cases of uncomplicated cataract.	20 (12M & 8F)	3′ 20″ to 16′ 15″	8′-30″	4 (20%)	10 (50%)	6 (30%)
	(Of these, number of cases receiving "ordinary Indian" diet for periods ranging over 1½ to 4½ weeks).	15 (10M & 5F)	3′ 27″ to 16′ 15″	9′-14″	nil.	10 (67%)	5 (33%)
B.	Number of indoor-patients suffering from various eye conditions other than uncomplicated cataract receiving ordinary Indian diet for periods ranging from 1 to 23 weeks.	19 (13M & 6F)	3′ 0″ to 23′ 20″	12′-5″	1 (5%)	8 (42%)	10 (53%)

According to Rotter's standards, 83 per cent of these patients were having adequate amounts of vitamin C in their nutrition, 10 per cent being saturated. Only 17 per cent, a relatively small proportion, were receiving or actually absorbing less than the adequate requirement. An interesting case in this group was the girl referred to above, aged 8 years, suffering from conjunctivitis. She was getting the juice of one batavian orange every day continuously for the last two months. Her intradermal test time was 3 minutes. This finding agrees with the observations made by us here, recently, regarding the shorter decolorisation time in people eating citreous fruits regularly and the reduction of the decolorisation time in the same individuals, when increased quantities of vitamin C were ingested.

In the second group of cases consisting of the in-patients of the Eye Wards, 20 were postoperative cases (12 males and 8 females) in whom the cataracts had been recently removed; and 19 were cases suffering from other eye diseases. The results in the first subgroup namely, the 20 postoperative cases of cataract may be first considered (Ref. Table III & I). Of the four patients whose decolorisation time was under 5 minutes, in only two cases the reduced time could be explained as due to the recent intake of citreous fruits. In the other two cases, no satisfactory explanation has been possible. In all, fourteen patients (70 per cent) showed a decolorisation time of less than 10 minutes and have, therefore, to be considered as receiving adequate amounts of vitamin C and six patients (30 per cent) were in a state of subnutrition with regard to vitamin C. The other subgroup consisting of 19 cases suffering from various eye conditions other than uncomplicated cataract (Ref. Table IV & I) have been uniformly getting "Ordinary Indian Diet"* for periods varying from one week to 23 weeks. The intradermal test done in these patients gave decolorisation times ranging between 3 minutes and 23 minutes 20 seconds. The average of these decolorisation time in this subgroup was 12 minutes 5 seconds.

Of the 20 postoperative cases of cataract mentioned above, 15 were on the ordinary Indian diet for periods varying from 1½ to 4½ weeks. The decolorisation time of these 15 patients ranged between 3 minutes 27 seconds and 16 minutes 15 seconds with an average of 9 minutes 14 seconds. The diet of these in-patients being the same (ordinary Indian) without any vitamin C supplement, the longer average time and the wider range of the decolorisation times recorded by patients with eye conditions other than uncomplicated cataract seems to be of some significance.

* *Ordinary Indian Diet*:—Sugar 1 oz., Bread 4 oz., Ghee ½ oz., Rice 1 lb., Butter milk ½ pint, Curry powder ½ oz., Tamarind ½ oz., Gingery oil ¾ oz., Salt ¾ oz., Plantain 1, Pepper water ½ pint.

TABLE II

Intradermal test in out-patients of ophthalmic department

No.	Name.	Time for decolorisation.	Disease.
1	C. S. (F)	3′— 0″	Conjunctivis B. E.
2	J. K. (F)	4′—10″	Healing corneal ulcers.
3	A. I. (F)	4′—30″	Trachoma & Keratitis B. E.
4	C. P. R. (M)	5′— 0″	Conjunctivitis B. E.
5	V. D. (M)	5′—10″	Corneal ulcer Rt.
6	C. S. N. (F)	5′—20″	Trachoma & Keratitis B. E.
7	V. S. (F)	6′—10″	„ „
8	B. R. (F)	6′—20″	Keratitis B. E. (Bleeding per gums).
9	T. V. R. (M)	6′—25″	Trachoma B. E.
10	V. M. (F)	6′—30″	Conjunctivitis.
11	Ch. S. (M)	6′—40″	Trachoma B. E.
12	C. M. (F)	6′—50″	„ „
13	K. C. (F)	7′— 0″	Recurrent styes.
14	S. B. (F)	7′—30″	Trachoma B. E.
15	G. M. (F)	7′—50″	„ „
16	D. H. R. (M)	8′— 0″	Conjunctivitis mild.
17	K. B. R. (M)	8′— 0″	Error of Refraction.
18	S. L. N. (M)	8′—30″	Old rupture cornea with Juvenile cataract Rt.
19	M. C. (F)	8′—30″	Xerosis.
20	S. V. R. (M)	8′—30″	Trachoma B. E. (Bleeding per gums).
21	A. Y. C. (M)	8′—45″	Conjunctivitis B. E.
22	A. A. N. (M)	8′—50″	Corneal ulcer.
23	M. A. R. (M)	9′— 0″	Catarrhal Conjunctivitis B. E.
24	B. S. (F)	10′— 0″	Trachoma B. E.; Phlyctenular Conj. Rt. Chalazion Rt.
25	A. B. (Fc)	10′— 0″	Acute conjunctivitis B. E.
26	R. N. L. (Fc)	12′— 0″	Conjunctivitis B. E.
27	S. K. M. (M)	12′— 0″	„ „
28	C. B. R. (M)	12′—50″	Trachoma & Keratitis B. E.
29	V. S. (M)	13′—20″	Angular conjunctivitis and angular stomatitis.
30	C. K. R.	19′— 0″	Acute Trachoma B. E.

TABLE III

Post-operative cases of uncomplicated cataract in the ophthalmic wards

No.	Name.	Sex.	Age.	Intradermal test-time.
1	*D. A.	F	60	3′—20″
2	G. G. P.	F	45	3′—27″
3	*M. S.	M	38	4′— 0″
4	*S. A.	F	60	4′—10″
5	G. N.	F	50	5— 0″
6	P. L. N.	M	50	5′—50″
7	Y. A.	M	45	5′—55″
8	*N. P.	M	66	6′—10″
9	P. S. Y.	M	55	6′—30″
10	R. M.	F	50	7′—10″
11	L. D. N.	M	65	7′—20″
12	S. A. N.	M	50	8′—55″
13	M. V. N.	M	60	9′— 5″
14	P. P. D.	M	48	9′— 5″
15	Y. R.	F	46	11′—48″
16	B. N. R. S.	M	48	12′—45″
17	*B. C.	F	60	13′—40″
18	B. Y. M.	F	60	14′—20″
19	L. M.	M	65	15′—10″
20	M. A. S.	M	60	16′—15″

All the patients except those marked* were getting ordinary Indian diet for periods ranging from 1½ to 4½ weeks.

TABLE IV

Inpatients of ophthalmic wards suffering from various eye conditions other than cataract (receiving ordinary Indian diet for periods ranging over 1 week to 23 weeks.)

No.	Name	Time for decolorisation.	Disease.
1	S. M.	3′— 0″	Trachoma & Keratitis Rt.
2	K. M.	5′— 0″	Trachoma B. E. Ulcer cornea and Leucoma adherens Rt.
3	P. M.	7′—10″	Hæmangioma.
4	A. N.	7′—30″	Trachoma, Pannus & Keratitis B. E.
5	M. P.	8′— 0″	Trachoma & Blepharitis. B. E.
6	B. J.	8′— 0″	Keratomalacia B. E.
7	S. V.	8—40″	Ulcer cornea Lt.
8	S. Z. A.	9′—45″	Retinitis pigmentosa, with secondary optic atrophy.
9	K. S. N.	9′—55″	Proptosis left & sinusitis
10	K. R.	11′— 0″	Trachoma B. E., Corneal ulcer Rt.
11	P. B. N.	11′—10″	Marginal Hypopyon ulcer with prolapse.
12	A. R. M.	12′—20″	Trachoma B. E., Mooren's ulcer Lt.
13	Y. P. N.	13′—25″	Subsiding optic neuritis.
14	G. S. R.	15′—50″	Papillary Trachoma.
15	C. R. S.	16—10″	Ulcer cornea.
16	M. S.	18′—55″	Rupture Cornea, Septic Iridocyclitis.
17	S. P.	20′— 0″	Trachoma, Ulcer cornea.
18	A. V. D.	20′—25″	Dacryocystitis B. E. with cataract.
19	N. S. B.	23′—20″	Trachoma & Keratitis B. E.

COMMENT

Hawley and Pearson (1938) did not agree with the findings and opinion of Bellows (1936) that the cataractous patients require much larger quantities of vitamin C than normal persons to raise the blood plasma level of ascorbic acid. On the other hand Seefried (1938) using a tolerance test, noted that the cataractous patients require more vitamin C than normal adults.

Our previous studies of intradermal test indicated that the average decolorisation time in normal adult students may be taken as 8 minutes, roughly, and that about 18 per cent of the students are suffering from undernutrition of vitamin C according to Rotter's standard.

An analysis of the present results shows that the average decolorisation time in ophthalmic out-patients is not significantly increased. In the case of the in-patients who were getting a uniform ordinary Indian diet there is a definite prolongation of average decolorisation time, slightly (9 minutes 14 seconds)

in the case of cataract patients, and more markedly (12 minutes 5 seconds) in the patients suffering from other serious eye conditions, majority of them being of inflammatory nature. The results also show that the percentage of the cases with undernutrition among the cataract patients is larger, 33 per cent, and the number of such persons among the patients with inflammatory conditions, etc. is as high as 53 per cent malnutrition of vitamin C is only 18 among healthy student population.

These findings suggest that vitamin C may have something to do with the inflammatory conditions of the eye. In this connection the animal experiments of Bock and Groszmann (1936) may be quoted. They found that addition of vitamin C to the diet increased the resistance of animals to experimental diphtheritic conjunctivitis. Therefore, the administration of vitamin C in inflammatory conditions of the eye seems to be indicated.

Further investigations and experiments may elucidate the variations in the requirement and utilisation, and therapeutic value of vitamin C in different ophthalmic conditions.

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CAPILLARY REACTION IN THE CHOLERA KIDNEY

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Renal function depends to a great extent on the vascular activity in the kidney particularly of the capillaries. In cholera, loss of blood volume and of the interstitial fluid and consequent fall of blood pressure play a great role in the activity in the capillaries and thereby of the renal function. The activity of the capillaries leads to a considerable variation in the glomerular pressure which, again, produces a train of manifestations in various different ways. In cholera, the glomerular pressure is invariably low which produces slow filtration through the glomerulus. The diminished quantity of the glomerular filtrate thus produced, allows increased reabsorption in the tubules leading to a further diminution in the quantity of urine. Normally, all the glomeruli are never put to action simultaneously. The fall of glomerular pressure in cholera leads to disuse of a still further number of glomeruli, thus considerably limiting the field of action.

It has been observed by the classical workers on cholera that the renal lesion in cholera consists mainly of the capillary engorgement of the organ. Rogers (1911, 1921, 1922) found nothing beyond congestion of the organs in cases dying in the acute stage. On the other hand, after suppression of urine, the most striking feature has usually been extensive hæmorrhage into the tissues of the organ, especially in the cortex both in the glomeruli and the intertubular tissues. He has observed that uræmia was more frequent in the hæmorrhagic form of cholera than in other cases, which is also accounted for by the action of the hæmorrhages into the kidney substance. Rogers and Megaw (1935) believe that the congestion and interstitial hæmorrhages might largely act mechanically in limiting the renal circulation. Crowell (1914) went further when he found parenchymatous degeneration or hæmorrhagic nephritis. In the latter condition the kidneys were swollen, dark in colour, the veins were injected and ecchymosis were seen.

The great congestion of the kidney undoubtedly, as suggested by Rogers, prevents the adequate circulation

of blood through it but in addition to this there appears a train of other conditions which form the subject of the present study.

The Material for the Present Study

The material consists of specimens obtained within half-an-hour after the death of the individual. All our previous studies have been done on specimens removed at least 24 hours after the death, and as cholera cases invariably occur during the summer months, the specimens, thus obtained, often became useless for finer studies on account of the post mortem changes which are invariably found. Only specimens removed within half-an-hour after death and fixed immediately in suitable fixative can satisfy this condition. The sections of the kidney are stained by a modified McGregor's (1929) method for the demonstration of the basement membrane of the capillaries and by Weigert's elastic tissue stain in addition to ordinary hæmotoxylin and eosin stains.

The Anatomical Findings of the Capillary Reaction in the Kidney

In majority of instances the capillaries of the glomerular tuft and those of the intertubular tissue are found to be dilated and engorged. This is found also in the other parts of the arterial tree extending up to the intralobular arteries of 150 μ in diameter.

The capillaries of the glomerulus are found to be swollen and very often the finger-like projections of the normal tuft dilated to an extent so as to appear like a globular mass filled up with packed up red blood cells. These dilated masses show presence of intact capillary basement membrane. The lumen of the glomerular capillaries as well as those of the afferent and efferent vessels shows densely packed up red cells. The internal elastic lamina of the vessels of 9-36 μ in diameter appears stretched and thinned so as to obliterate the usual wavy outline. The intima, media and adventitia of small vessels are found to be normal. The afferent arterioles and the intralobular arteries often show the media lost of its cellular structure being replaced by homogeneous matrix. The main branches of the renal artery show no abnormal changes. The dilatation of the vessels are thus found to occur in the interlobular arteries of approximately 150 μ in diameter extending to the afferent and efferent vessels to the glomerulus and the capillaries of the glomerulus itself. The red blood cells are very often found to occur in the media and adventitia of the vessels as well as outside the same indicating greatly increased permeability of the vessels.

All the capillaries of the kidney are not functionating at any one time. Only a portion of the capillary supply of the organ remains open and functionating. Numerous glomeruli remain bloodless while in others blood may be flowing through only one or two capillary loops of the tuft. From this it appears that the actual field of glomerular filtering area is much smaller than the potential filtering surface. As the rate of filtration depends on the area of the filtering surface the rate must vary according to the number of the active glomeruli and the number of patent capillaries in the glomeruli. This is due to the extreme variability of the mean pressure in any one of the capillary loops. As the capillary flow in the actual glomerular filtering area is most delicately controlled by vasomotor activity which opens up the patent capillary of individual glomerulus and thus controls the role of filtration, opposite effects are produced according as the afferent or efferent side of the vessel is controlled by the vasomotor system. If the vasoconstriction takes place in the afferent vessels, the urine volume is diminished while it is increased if it takes place in the efferent artery. Thus renal blood flow differs essentially from that of other organs due to the varying effect on the intracapillary blood pressure.

In cholera, occlusion of the glomerular capillaries by their engorgement leading to cessasion of blood flow produces a great reduction of the filtering surface and thus the rate of filtration is affected to a considerable extent. This occlusion of the glomerular capillaries invariably leads to a great disturbance in the function of the tubule. As more and more capillaries are becoming inactive due to their dilatation and engorgement leading to stagnation and loss of flow through the glomerulus the remaining glomeruli which are being inactive normally are called in more and more to take up the function. The capillary reserve in the inactive glomeruli are thus mobilised.

Renal Blood Flow and Intracapillary Blood Pressure in Cholera

The filtering mechanism of the kidney is dependent not so much on the intracapillary blood pressure in the glomerulus as on the difference between this and the pressure in the Bowman's capsule. A good number of glomeruli in cholera show dilatation of the Bowman's capsule along with granular debris indicating accumula-

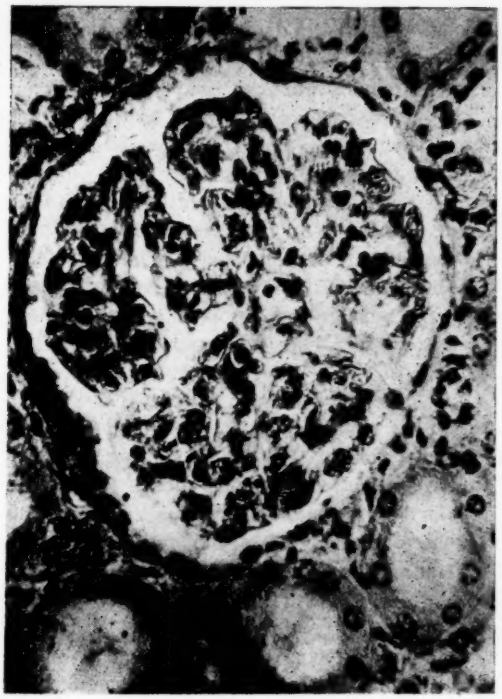

Fig. 1. Glomerulus showing engorgement of the capillaries.

Fig. 2. Glomerulus showing engorgement of the glomerular capillaries as well as the afferent and efferent vessels to the glomerulus. Numerous red blood cells are present in the Bowman's capsule.

Fig. 3. Great dilatation and engorgement of the intertubular capillaries.

Fig. 4. A blood vessel of the kidney showing presence of red blood cells in the wall and outside the vessel.
Capillary Reaction in the Cholera Kidney—BANERJEE.

tion of material raising the pressure therein. The hydrostatic pressure is invariably reduced to a considerable extent in all cases of cholera and that persists throughout, only being temporarily raised by intravenous injections. The diminution of the hydrostatic pressure, which alone is sufficient to produce renal failure in cholera, is invariably associated with the more important factor, the great loss of renal blood flow due to the stagnation and occlusion of the capillary bed by the engorgement of the glomerular capillaries.

Oxygen Supply and Capillary Reaction

Stasis of blood in the systemic capillary circulation, in cholera, leads to loss of blood volume for the heart to continue its action, less blood is thus returned to the heart and the presence of hemoconcentration adds to the tendency to accumulate in the capillary system. This peripheral stasis is due to the impaired action of the peripheral vasomotor nerves. This atonic condition of the capillary leading to stasis may be either the cause or effect of deprivation of oxygen supply which may be even temporary.

Krogh and Rehberg (1922) have shown that capillary hyperæmia developed when there is lack of oxygen. This hyperæmia became more and more marked as the oxygen content of the blood diminished. They are of opinion that this takes place due to lack of oxygen and not to the accumulation of acids. Various other workers have confirmed the findings of Krogh and Rehberg, all on experimental grounds. There are still others who believe that the functional hyperæmia is caused by accumulation of acid metabolites or a specific vasodilator substance or a combination of both. In cholera, the great fall of blood pressure as a result of considerable loss of fluid through vomiting and purging leads to a lack of oxygen to the kidneys. This factor with the accumulation of considerable amount of the waste products as metabolites having vasodilator properties, in addition, produces the reactive hyperæmia. Banerjee (1931) has pointed out the great importance of vasomotor failure in cholera.

As a result of this reactive hyperæmia it is observed that a large proportion of the total capillary bed which remains closed and bloodless under normal condition opened up simultaneously with further increase in the diameter by dilatation, their capacity to hold the blood increased very considerably. The marked widening and engorgement of the capillary thus removes a good amount of effective blood volume from circulation. One can assume from this that a considerable portion of the total blood, still remaining after the profound loss of the interstitial fluid, is used to fill up the dilated capillaries and so constitute to a great extent in the production of low blood pressure and incidentally in a vicious circle to the renal function. This phenomenon when added to the great diminution of the total volume of blood due to evacuation leads to a gross functional damage to the kidneys in cholera.

The renal vascular failure in cholera is only a part of the whole systemic peripheral capillary failure. The arterial system is found to be empty while the venous system, particularly of the splanchnic area, engorged. This leaves the capillary system stagnant and the fall of blood pressure remaining as low as before. This explains cases in which the effect of intravenous injection is often transitory as if the intravenous fluid is poured into a hollow organ.

The Change in the Hydrostatic Pressure of the Glomerulus, the Colloid Osmotic Pressure and Permeability of the Capillaries

Several important factors have just now been mentioned which interfere to a considerable extent the mechanism of filtration in cholera kidney. There are other factors almost of equal importance, which control the rate of flow of the blood in the capillaries of the glomerulus in cholera.

The hydrostatic pressure in the glomerulus is the difference between the blood pressure in the glomerular capillaries and the hydrostatic pressure in the glomerular capillaries alone constitute the main factor for the glomerular filtration. Increase in the pressure of the glomerular capillaries will increase filtration while increase in the hydrostatic pressure in the Bowman's capsule will retard it.

The osmotic pressure of the colloids has the opposing influence on the hydrostatic pressure. The hydrostatic pressure must exceed the osmotic pressure of the colloids in order to have proper filtration. The filtration pressure which is the glomerular capillary blood pressure minus the colloid osmotic pressure, has been estimated by Ekehorn (1931) in the human glomeruli as something between 38 and 76 m.m. of Hg. The colloid osmotic pressure of the arterial side of the capillary is fairly uniform throughout the body as the source of this fluid is from the heart. There is an exception to this in the renal tubule as considerable

change of the fluid takes place in the glomerulus before the capillary carries the blood to the tubule.

The colloid osmotic pressure is greatly controlled by the rate of flow of blood through the capillaries. In cholera, stagnation of blood in the capillaries takes place which causes more and more fluid to be removed from the serum in a given time, the proteins and lipoids become more and more concentrated leading to a proportionate rise of colloid osmotic pressure and so diminution of filtration. In cases of complete stagnation, filtration stops altogether and cannot start again unless the blood flow is re-established.

Stasis of Blood and Permeability of the Capillaries

The passage of substances *e.g.,* plasma protein or even R.B.C. takes place not by the process of osmosis but by direct penetration through the endothelial membrane. This takes place in cholera and also in various pathological conditions. Starr (1926) has observed that the glomerular capillaries are very sensitive to oxygen, lack of which renders them permeable to protein. The undue permeability of the capillary walls in the alimentary tract in cholera undoubtedly leads to a great depletion of the interstitial fluid. The capillary permeability in the kidney also can be fairly estimated by the protein content of the urine. When the capillary permeability is slightly increased a trace of protein is found in urine and no red blood cells; when it is greater, the protein content may become 0·5 grm. per cent while in extreme cases the walls become so permeable as to show presence of copious albumen and presence of fair number of R.B.C.'s in the urine. Banerjee (1939) has already called attention to the findings of urine in cholera which go to show a great amount of permeability of the renal capillary walls.

When examined histologically, the evidence of extreme damage to the capillary wall is found in the form of hæmorrhages inside the glomerulus and also in the intertubular tissue. The presence of hæmorrhage indicates the presence of necrosis of the capillary wall. Red blood cells are also seen in the Bowman's capsule and the glomeruli are greatly engorged.

In cholera, this permeability varies very widely. Banerjee and Datta (1935) have pointed out that from the examination of urine one finds a kaleidoscopic picture which is extremely variable at different periods, often within very short periods. Thus one finds copious albumin and R.B.C. in the urine at one time while within a few hours the picture has completely changed only to reappear after a short time. This wide variation probably depends on the oxygen supply and other influences. With the deficient supply of oxygen as a result of capillary stasis the permeability might be greatly increased only to be less permeable when the oxygen supply became more adequate.

Summary

A great capillary hyperæmia along with vasodilatation of the glomerular capillaries and consequent stasis and loss of oxygenation is found to be a constant feature. This amounts to renal vascular failure which is again a part of the systemic capillary failure.

Loss of fluid, on the other hand, producing loss of effective blood volume, leads to a great fall of systemic blood pressure and thus affecting the hydrostatic pressure in the glomerulus which is thus greatly lowered. This, again, being opposed by the colloid osmotic pressure leads to a greater lowering of the filtration pressure. Altered permeability of the capillary endothelium due to its damage also play a great role.

This capillary failure in the kidney in conjunction with great loss of interstitial fluid and hypochloræmia constitute the mechanism of the renal failure in cholera.

Acknowledgment

My thanks are due to Prof. C. C. Basu for his helpful interest and to Dr. B. Basu for technical assistance in the work.

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FUNCTIONAL BLEEDING OF THE UTERUS AT THE AGE OF PUBERTY

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The functional bleeding of the uterus comes off at all ages in women. But the occurrence of such bleeding nearing puberty becomes a great problem to a doctor. The girls are usually virgins. The few of them who are married do not show anything pathological on investigation.

Before proceeding with the disease it would be essential to discuss the physiology of menstruation.

The menstruation is governed by the hormones of the anterior pituitary gland, prolan A and B. The former stimulates the follicle-maturation and sensitises the follicle to the lutenising property of the prolan B, which is a corpus luteum activator. In every lunar month we find two activities going on in the ovaries. In the first half of the month there is the Graafian follicle formation. It usually ruptures on the fourteenth day and then the formation of the corpus luteum takes place. The later has its sparing time upto the onset of menstruation if no pregnancy takes place. Two hormones are secreted by the ovaries: œstrin in Graafian follicle and progestrone in corpus luteum.

Immediately before and during menstruation there is a gradual rise in œstrogen content in blood and urine. In fact this is one factor which brings the menstruation and not the lowering of œstrin contents as described by Bhatia. Due to the increase of œstrin contents the uterus contracts actively before and during menstruation. The intermittent contractility serves to increase the volume of the flow of the blood through the dilated endometrial vessels because of pumping action of the movements.

A longitudinal group of muscle fibres exists immediately beneath the tunica intima of the arteries. The fibres of the tunica media of these arterioles are continuous with the intrinsic muscle fibres of the myometrium. This establishes a direct connection between the muscle fibres and the arterioles.

During the menstrual cycle the mucous membrane of the uterus increase in size, it becomes œdematous. The glands become tortuous. The arterioles proliferate much more rapidly than the uterine mucosa. They become more and more tortuous until they assume a spiral shape. The spiral arterioles arise from the arcuate branches of the uterine artery in the middle third of the myometrium. They become radial in their course through the inner fourth of the endometrium and finally extend toward the endometrial surface.

Immediately preceeding menstruation these spiral arterioles alternately constrict and dilate giving rise to the so-called blush and blanch phenomenon. Then the peripheral portion of these arterioles dilates one by one, in widely disseminated portions of the mucosa and at varying intervals extravasation of blood occurs which combined with retrograde flow from the venous capillary bed appear externally as menstruation.

In brief the menstruation is fundamentally a vascular phenomenon. Excessive bleeding would occur if proximal of myometrial portion fails to contract or be contracted following the initial extravasation of blood distally. Therefore, regardless of the precipitatory factor be it myoma, subinvolution, pelvic inflammatory disease or merely functional, one of the basic causes of excessive uterine bleeding is a disruption of the normal hæmodynamics of the uterine circulation at the time of menstruation aided and abetted by a disturbance in the normal pattern of uterine contractility at the same time. Further, the œstrin contents of blood and urine are very much increased before and during menstruation in the cases of functional bleeding of the uterus. 6 cases came under our observation. Their ages varied from 14-17 years. They were all unmarried. Three of them had functional bleeding from the very onset of menstruation and in other free bleeding had become constant after one year of the onset of menstruation. They were all well-built. Heart and lungs were quite healthy.

Per vaginum hymen was intact. Per rectum nothing abnormal could be detected. Blood count was normal. Biopsy examination was not possible.

Considering the disease to be a disruption of normal hæmodynamics of uterine circulation testosterone propionate would be best indicated. Its action lies in the following:—

1. In inhibition of œstrogen-induced rhythmic contractility of the uterus.

2. As a result of above in diminishing the volume of the flow of blood to the uterus.

3. In stimulating the myometrial elecents.

The inhibition of intermittent uterine contraction is not accompained by a true relaxation but merely by a decrease in tension. This therapy has been tried on 6 cases. All of them had progynon and corpus luteum treatment beforehand. Testosterone propionate upto 600 mg. in graduated doses was given but it was all of no avail except in one case.

After short interval of testosterone treatment the parents of the failure cases were kind enough to bring their girls for further advice and treatment. As suggested by Niwlajiw and Gurewitch these patients were put on Kongo red treatment for 5 days and the bleeding stopped. The action of the Kongo red lies (1) in an increase of thrombocytes and coagulation time, (2) in the activation of reticulo-endothelial system, and (3) in the compression of the capillaries by the perithelial cells which get swollen by absorption of the dye. But inspite of this the results are not permanent. The bleeding recurs again.

After rest of 3 days the patients were given 10-15 c.cm. of blood transfusions of homologous groups triweekly for 3 weeks. Three were permanently cured and one improved, one remained unaffected.*

* Read at the Scientific Section of the XVII All-India Medical Conference, Vizagapatam. Dec., 1940.

ANAESTHETICS AND METHODS OF ANAESTHESIA IN COMMON USE—A SURVEY

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It is the aim of this paper to survey the anæsthetic practice obtained here in all its bearings with the help of data collected as accurately as practicable from the records available. It must be confessed, however, that the system of recording is by no means perfect and that due attention has been paid to sift the essentials from non-essentials and to eliminate all possible errors.

Until very recently anæsthetic practice, both in hospitals and in private nursing homes or clinics, centered round chloroform amongst inhalational agents and novocaine or stovaine amongst local analgesics. There has been a deep-rooted prejudice against a change from the old order. Reasons, of course, there are for the justification of this attitude. Anæsthesia was not regarded as a speciality. A general practitioner was held to be competent to administer anæsthetics and that an intensive period of training is essential to qualify a medical graduate for the job, has not been insisted on either. The pre-eminent position of chloroform rested on its potency, rapidity and ease of induction. The apparatus for the administration was inexpensive and simple—one that could be readily improvised with a cone of lint or flannel in the absence of the orthodox Schimmelbusch inhaler or Junkers'. There is the other side of the picture. The factor of safety has not been taken into acount. Mortality figures under chloroform and the range of surgery, routine and emergency, possible within the safety limits of the anæsthetic has not received the publicity that it deserves. That chloroform is still popular in obstetric surgery, is a fact that cannot be disputed in our country. The limited scope of surgical intervention, the minimal demands on anæsthesia and the good general condition of majority of this class of patients seem to account for the popularity. The same is not true of general surgery.

The sole aim of anæsthesia must be to render surgical procedure painless and free from unpleasant memories or in other words free from shock, psychic or traumatic. It has to guarantee maximum safety to the patient and minimum interference or non-interference with metabolic activities of the system. Great progress has been made in anæsthetic agents and methods in this direction and marvels of modern surgical technique bear ample proof of the advance of anæsthesia. A wholesale introduction of modern methods in anæsthesia into our country without adaptation to local conditions is unthinkable on grounds of economy and expediency until self-sufficiency is attained through rapid industrialisation. Nevertheless, the existing facilities may be utilised to the fullest extent to serve as a great incentive to further progress. Anæsthetic ether and ethyl chloride are manufactured in

India by various firms such as Bengal Chemical and Pharmaceutical Works Ltd., Alembic Chemical Works of Baroda, etc., while navocaine, nitrous oxide, evipan, percaine etc. are imported from abroad.

TABLE I—ANAESTHETIC AGENTS

	Anæsthetic Agents in use	Number
1.	Ethyl Chloride *cum* Eau-de-cologne ½% ..	2,906
2.	Ether Anæsthetic	2,866
3.	Chloroform	616
4.	Chloroform-Ether mixture (C.1, E.2 or C.2, E.3)	1,767
5.	Nitrous Oxide-Oxygen 296	
	Nitrous Oxide with a trace of Ether 65 ..	361
6.	Sodium Evipan and Pentothal Sodium	52
7.	Novocaine	1,669
8.	Percaine	849
9.	Paraldehyde	106

TABLE II—ANAESTHETIC METHODS

	Anæsthetic Agents in use	Number
A.	*General*	
1.	Ethyl Chloride open method	1,240
2.	do. closed do.	1,666
3.	Ether open do.	2,138
4.	do. closed do.	428
5.	do. Intratracheal method	60
6.	Basal Narcosis with Rectal Paraldelyde and Ether	80
7.	Intravenous Anæsthesia with Sodium Evipan ..	52
8.	Chloroform or C_2 E_3 mixture Open	2,383
9.	Intrapharyngeal Vapour Chloroform	503
10.	Nitrous Oxide with Oxygen—with or without Ether —Closed Method	361
B.	*Combined Anæsthetics*	
1.	Local analgesia and General with Ethyl Chloride-Ether Oxygen	175
2.	Local analgesia and General with Ethyl chloride-C_2 E_3 or $CHCl_3$	4
3.	Local analgesia or Spinal Percaine or N_2O; O_2 with trace of Ether	39
4.	Basal Narcosis with Rectal Peraldelyde with local analgesia with ½% Novocaine and General with N_2O, O_2 and trace of Ether	26
C.	*Local Analgesia*	
1.	Infiltration. Field Block with ½% Novocaine and adrenalin 1 in 10,000, 2 minims to an ounce ..	502
2.	Caudal or Extra-dural with 2% Novocaine ..	917
3.	Spinal or Sub-arachnoid Block with Percaine 1 in 1.500. Sp. Gr. 1004 Hypobaric solution ..	810
4.	Nerve Blocks with 2% Novocaine including Sciatic Obturator Femoral Poplitelas, Maxillary Mandibulars, Brachial Plexus	26

From Table I it is clear that ethyl chloride is the commonest one in use. It is an ideal and inexpensive drug for short anæsthesias. It is highly volatile—both induction and recovery are rapid. Eu-de-Cologne in it makes it quite acceptable to most people. The only after-effects are nausea or actual vomiting and excitement. The drug is tolerated quite well from infancy to old age. Closed method administration is more economical than open one as is seen in Table II—A. Together with adequate amounts of oxygen the unpleasant sequela are reduced to a minimum. No deaths have occurred under ethyl chloride in the series.

Ether is the anæsthetic agent of choice and keeps well under the present method of storage. Samples of ether locally manufactured have been subjected to periodical tests and have always come up to the B.P. standard of purity. The open method, by reason of simplicity of technique is more widely used than the closed method of administration. The apparatus for the latter method is more complicated and expensive. Hewitt's widebore inhaler, an improvement on the original model of Clover, is the one commonly used. Mastery of the technique can easily be acquired by constant practice. The usual Schimmelbusch inhaler can easily be improvised by means of hand towels to convert the open into a semi-open method.

Chloroform is employed to a very limited extent in diathermy cauterisations, in operations on the throat in the E.N.T. department and in obstetrics. Only the open method is in vogue. Vernon Harcourt apparatus for regulating percentage of chcloroform has fallen into disuse in recent years.

Nitrous oxide is by far the best and safest anæsthetic agent available but is expensive. It is manufactured in Calcutta and a few other places.

Sodium Evipan suffers from the same disadvantage of cost as in nitrous oxide. It is bound in future to displace ethyl chloride from its present position.

Local analgesia has proved its usefulness both as regards safety to the patient and facility to the surgeon. With the development of various methods of its employment local analgesia promises to be the method of choice in major surgery not only amongst those desperately ill but also amongst those who are good surgical risks. Majority of the patients over here have the necessary temperament for the local analgesia. Given the requisite patience on the part of the surgeon, the success of the local method is well nigh established. Of the various methods of local in use

the caudal or the extra-dural sacral block deserves to be placed in the forefront for satisfactory result and safety factor.

A. *General Anæsthesia*—Complications are: Ether tremors; circulatory and respiratory depression with two deaths or a mortality rate of 0·06%. Of these two deaths, one is under $CHCl_3$ and is solely due to bad choice of anæsthetic and the remaining one occurred under sodium evipan. With greater judgment further reduction of mortality rate should be possible.

TABLE III A—ANALYSIS OF IMMEDIATE COMPLICATIONS DURING ANAESTHESIA

Anæsthesia	Ether Tremors	Nausea	Headache	Nervous fit	Circulatory depression	Respiratory depression	Convulsions	Total	Deaths.
General:									
Ethyl Chloride-Ether	1	—	—	—	8	—	—	655	
$CHCl_3$ or C_2E_3	—	—	—	—	8	3	—	1,803	1
N_2O; O_2	—	—	—	—	4	—	—	108	—
Sod. Evipan	—	—	—	—	1	1	—	80	1
Combined:	—	—	—	—	10	—	—	88	—
Local:									
Local	—	1	2	—	1	—	—	1,875	1
Spinal	—	5	16	—	16	1	—	454	—
Caudal	—	1	—	1	—	—	1	361	—
	1	7	18	1	48	5	1	4,864	3

B. *Local Analgesia*—Nausea, headache, nervous fit, convulsions, circulatory and respiratory depression are the chief complications with one death or a mortality rate of 0·04%.

TABLE III B—ANALYSIS OF POST-ANAESTHETIC COMPLICATIONS INCLUDING MORTALITY

Anæsthesia	*Respiratory complications incidence*	*Mortality rate %*	*Total Mortality from all complications.*
General:			
Ethyl Chloride	—	—	0·52
Ethyl Chloride and Ether ..	—	—	2·57
Chloroform or C_2E_3 mixture	0·42	0·42	1·4
Nitrous Oxide; Oxygen ..	1·95	1·95	7·45
Sodium Evipan ..	1·9	1·9	1·9
Combined Local and General:			
Local + $CHCl_3$ or C_2E_3 ..	33·3	16·6	35·45
" + N_2O; O_2 ..	—	—	17·25
" + Ethyl Chloride-Ether ..	5·55	1·85	17·6
Local:			
Loal	12·1	3·95	14·13
Spinal	2·3	0·78	2·88
Caudal	—	—	0·52

Various post-anæsthetic complications are grouped under the headings of respiratory, circulatory complications, toxæmia, exhaustion and death.

Respiratory ones include inflammatory conditions, massive collapse, gangrene of the lung, infarct, œdema of larynx and lung.

Circulatory ones consist of shock from various causes and failure of myocardium. Diabetic coma, uræmia, and pyæmic conditions comprise the toxæmic group. Under exhaustion malignant cachexia, inanition etc. are classified.

Local analgesia combined with C_2E_3 or chloroform shows the highest mortality and incidence of respiratory complication. Toxicity of chloroform by itself is responsible to the extent of 52·7% for the death. The liability to ventricular fibrillation caused by adrenalin contained in ½% novocaine solution is also a potent causative factor particularly in combination with local analgesia. Respiratory complication and death from it are also the highest. The local irritant action of inhalational anæsthetic is generally blamed for the incidence. Neither local analgesia nor chloroform used for supplementing it is to be incriminated. This is borne out by the fact that local analgesia alone without general comes next to combination local and chloroform in regard to mortality and complications referred to and that purely general anæsthesia with chloroform or ether shows the least or none at all in this respect. It should also be remembered that local analgesia has been employed in rather poor surgical and where local fails to secure freedom from discomfort or pain to the patient general anæsthesia is resorted to. Factors, such as gravity of the disease, severity of operation, age of the patient, site of operation, focal sepsis etc. play an important role as indicated in Table III. N_2O; O_2 is to be preferred to ether in supplementing the local in order to reduce the liability to respiratory complication or mortality. Furthermore the occurrence of post-anæsthetic sequelæ is in a good number of cases, coincidental and not incidental to anæsthesia for autopsy findings have revealed the existence of extensive gangrene or broncho-pneumonia in

TABLE IV—ANALYSIS OF COMPLICATIONS IN ROUTINE SURGERY.

Anæsthesia.	Total No.	Respiratory			Circulatory		Toxæmia		Exhaustion		Total Deaths		Cause of Death or Complication									
		Broncho Pneu.	Rest.	Death.	Shock.	Death.	Incidence.	Death.	Incidence.	Death.	Number.	Per cent.	Disease Risk.	Operation.	Anæsth-esia.	Site.	Duration.	Age.	Focal Sepsis.	Undeter-mined.	Wound Sepsis.	Burns hot water.
Gynec. & E.N.T. Depts. (1935-39)																						
General (2021 cases):																						
Ethyl chloride ..	28																					
Ethyl chlor Ether O_2	298				6/2·01	3/1·007	2/0·6	2/0·6			7	2·35	36·9	23·8	28·3		7	7				
$CHCl_3$ or C_2E_3 ..	1647	1/0·24	3/0·24	4/0·24	3/0·18	3/0·18	8/0·48	7/0·24			15	0·9	38·8	9·7	24·9	1·8	1·8	8·6		19·4		
N_2O. O_2 ..	43	1/2·8		1/2·3			4/9·3	3/6·9	1/2·3	1/2·3	5	11·6	75		8·6			16·4				
Sod. Evipan I.V. ..	5																					
Combined (23 cases):																						
Local and $CHCl_3$ ..					1	1					5	21·7	25	25	25		25					
Local + N_2O. O_2 ..					2	2							75	25								
„ +ECl_2 Ether O_2					1	1	1	1					50	16·6	25		8·4					
Local (1684 cases):																						
Local Infiltration etc.	1382	1/0·07		1/0·07	4/0·3	3/0·2	1/0·07	1/0·07			5	0·37	52·8	25				11·1		11·1		
Spinal	196				5/2·5	3/1·5	1/0·5				3	1·5	36·1	36·1	19·4		8·4					
Caudal ..	156										1	0·64	50					50				
No Anæsthesia ..	1170								8/0·68	8/0·68	8	0·68						33·3		66·3		
General Surgical Dept. (1935-36)																						
General (759 cases):																						
Ethyl chloride ..	161							0·6			1	0·6	100				5	15		10		
Ethyl Chlor.-Ether ..	357				0·8	0·8	1·4	1·4	·28	·28	10	2·8	37·5	10	20		11·1					2·5
$CHCl_3$ or C_2E_3 ..	156	0.6		0·6	1·2	1·2					3	1·9	16·8	11·1	33·3	27·7						
N_2O; O_2 ..	60		1·6	1·6	1·6	1·6					2	3·3	50	25	25							
Sod. Evipan I.V. ..	25		4·0	4·0							1	4·0			100							
Combined (60 cases):																						
Local+$CHCl_3$ or C_2E_3	3		66·6	33·3							2	66·6	19·6	8·3	52·7	11·1		8·3				
„ +N_2O; O_2 ..	27				11·1	7·4	11·1	11·1	3·7	3·7	8	25·9	49·6	12·5		21·8	3·3	15·5	3·3			
„ +ECl_2 Ether O_2	30	11·1		3·7	16·6	13·3					8	26·6	16	12	20	20		24		8		
Local (506 cases):																						
Local Infiltration etc.	48	18·9	9·3	6·9	11·6	11·6					12	27·9	30	5		25				15	20	5
Spinal	258	4·6		1·56	3·1	2·7	·38					4·26	28·6	15·5	15	15·5	6·2	11·9		7·3		
Caudal ..	205										1	0·4	50					50				

cases of gastric or duodenal ulcers which were neither anæsthetised nor operated on. It is thus seen that the gravity of the disease and the low resistance of the patients can account for a high rate of mortality apart from the strain of anæsthesia and major operation. The choice of safe anæsthetic procedure will no doubt serve the best interest of the suffering humanity and the surgeon alike.

Summary and Conclusions

1. Local analgesia is by far the safest and most economical procedure.

2. A combination of basal narcosis, a light general anæsthesia with nitrous oxide-oxygen with minimal amounts of ether, when required and local analgesia approach nearly an ideal anæsthesia—one that must be selected in all major surgery with few exceptions.

3. Ether should be the anæsthetic of choice in good surgical risks where general anæsthesia is selected and chloroform is to be resorted to under special indications such as diathermy work etc. or in those exceptionally few cases where ether is contra-indicated.

4. For short anæsthesia ethyl chloride serves admirably well.

5. Intravenous sodium evipan has a bright future as a rival to ethyl chloride both for induction and for short anæsthesia. Cost is prohibitive for a wider application.

6. Of the various post-anæsthetic sequelæ met with, the respiratory complications merit consideration. These include hypostatic or broncho-pneumonia, gangrene of the lung, massive collapse, emboli, infarction and ether tremors. It is difficult to determine correctly to what extent anæsthesia is an etiological factor for the complications. Local irritant action of inhalation anæsthesia does not appear to be primarily responsible as the incidence of these complications is not less if not greater in various forms of local analgesia. Site of operation (normally upper abdomen which reflexly inhibits normal respiratory movements), presence of focal sepsis and low resistance appear to play the chief role. Rapid elimination of the anæsthetic agent from the system through hyperventilation by inhalation of 7% mixture of CO_2 and O_2 at the end of operation and deep breathing exercises during the first four days of the post-operative period tend to minimise the occurrence of the complications.

Acknowledgment

I am deeply indebted to the various surgeons of the Hospital for permitting me to review their case records and to Dr. E. K. P. Nambiyar, Junior Anæsthetist, for the help rendered in compiling the statistics.*

*Read at the Scientific Section of the XVII All-India Medical Conference, Vizagapatam, Dec. 1940.

JOURNAL OF THE

INDIAN MEDICAL ASSOCIATION

CALCUTTA, AUGUST 1941

INDIAN MEDICAL SERVICE

We would draw the attention of our readers to certain resolutions passed by the Working Committee and the Central Council of the Indian Medical Association and the communique issued by the Government of India on the same subject. Some of the resolutions we wish to refer to were passed in Bombay on the 26th and 27th July, 1941, and are published in this issue; others were passed earlier. The Central Government's communique was issued after the recent Simla Conference. They deal with the important subject of the appointment of Indian doctors to the Indian Medical Services, with special reference to Emergency Commissions. The importance of this subject cannot be over-emphasised for Indian interests are radically affected.

We have always maintained that the organisation of the Civil side of the I.M.S. has not served the purposes for which it was established. Dr. Jivraj Mehta, in a recent speech at Bombay (published in our June issue), dealt elaborately with the subject of appointments to the Emergency Commission, and he quoted facts and figures to support his statements. We hope that authorities concerned will pay due consideration to the points raised therein. Experience gained in the last World War, and also in the present War, has proved that the only dependable medical War reserve for the Indian Army is the open Medical Profession in India. This is the case in England and, in fact, all other countries.

Before the year 1937, there was no racial discrimination, at least not of a statutory nature, against Indians, regarding their entry into the I.M.S. It now appears, however, that the promulgation of the Defence Department Resolution No. 205, dated the 25th March, 1937, is crystallising the I.M.S. into two water-tight compartments, one for British members, and the other for Indian members. After considering the present situation in the country, we are of opinion "that a mere appeal to the patriotic sentiments of medical men in India" will not fully serve the purpose for which it is made unless at the same time fundamental changes are made in the I.M.S. We concede that the Government Communique, issued after the recent Conference at Simla, offers some improvements in the machinery devised for future appointments to Emergency Commissions in the I.M.S. and in the terms and conditions offered to new entrants. But it is regrettable that the Conference did not come to a decision regarding the vital questions of the Civil side of the I.M.S., a matter on which our Association has repeatedly expressed a strong grievance.

WANTED A LIBRARY

We are feeling every day the necessity of a good reference library. The Journal of the Indian Medical Association is suffering from this want all along. It is high time that steps should be taken by all concerned to remove this long felt and everyday growing want.

The Editor, Journal of the Indian Medical Association, will gratefully accept any book, journal or medical publication, recent or old, which members may kindly present. Such gifts will be duly acknowledged in the columns of the Journal. Gifts of monographs and books written by members will be specially appreciated.

NILRATAN SIRCAR,
Editor, J. I. M. A.

CURRENT MEDICAL LITERATURE

MEDICINE

Acute Nephritis

Hayman and Martin (*Am. J.M.Sc.*, 1940:200:505) in reporting on the study of 77 cases of acute glomerular nephritis observe that 75 per cent of the cases followed infection of the upper respiratory tract, that the disease is most common before thirty though occurring at all ages, that the cardinal symptoms of hæmaturia, hypertension and œdema were not all present in every case, that approximately half the cases subjected to adequate study showed evidence of cardiac involvement, that 10 patients (9 per cent) died in the hospital primarily of acute nephritis and 52 of the remaining 67 cases were followed up for from 6 months to 8 years and of these 35 (67·3 per cent) are well, 9 (17·3 per cent) have persistent albuminuria or hypertension, while 3 have died of uræmia since discharge from the hospital and 5 have chronic glomerular nephritis.

Chronic Cor Pulmonale—Its Relation To Pulmonary Tuberculosis

Ackerman and Kasuga (*Am. Rev. Tuber.*, 1941:43:11) points out that the subject of chronic cor pulmonale or hypertrophy of the right side of the heart has been neglected. It may be either primary or secondary. The secondary type is common and is due to any condition arising out of failure of the left side of the heart. The primary type is due to changes in the vascular arterial system of the lungs or the widespread alterations in the lung parenchyma (bronchiectasis, silicosis, bronchogenic carcinoma, etc.,) and the thoracic cage. Diagnosis of the primary type depends on the demonstration of enlargement of the pulmonary artery and the right ventricle. The authors in the following lines give the summary of their observations on chromic cor pulmonale in relation to pulmonary tuberculosis: 1. The incidence of hypertrophy of the right side of the heart with marked failure is low in uncomplicated pulmonary tuberculosis. 2. Hypertrophy of the right side without failure occurs in about 6 per cent of all patients dying of pulmonary tuberculosis. 3. In several types hypertrophy of the right side with or without failure tends to develop—these include chronic productive tuberculosis of long duration with secondary emphysema (common), chronic productive miliary tuberculosis (rare) and pulmonary lesion complicated by silicosis or anthracosilicosis; pneumothorax of long duration with marked collapse and thickened pleura at times and thoracoplasty may cause hypertrophy. 4. If cardiac and pulmonary diseases which cause pulmonary hypertension are co-existent failure of the right side of the heart will appear early. 5. The changes in the pulmonary arterial tree are usually degenerative and rarely hyperplastic. 6. The cause of occasional cardiac hypertrophy of the left side associated with pulmonary disease which should cause only hypertrophy of the right side remain unexplained.

Cerebral Manifestations of Bacterial Endocarditis

Toone (*Ann. Int. Med.*, 1941:14:1551) writes that the fundamental pathologic change in the central nervous system in cases of bacterial endocarditis is a diffuse embolic meningoencephalitis and from this the various clinical manifestations arise. The types of lesions are pleomorphic and no local area of the brain appears to be predisposed to injury. The presence of a sterile meningitis in any case of an obscure febrile illness should always suggest the possibility of a viridans endocarditis. The triad of clubbed fingers (Hippocratic), splenomegaly and meningo-encephalitis is presumptive evidence of acute bacterial endocarditis in spite of abscence of signs of cardiac lesions.

The Treatment of Amyotrophic Lateral Sclerosis with Vitamin E (Tocopherols)

Wechsler (*Am. J.M.Sc.*, 1940:200:765) gives in the following lines the summary of his observations:

1. 20 cases of amyotrophic lateral sclerosis treated with vitamin E have been studied and results reported. 2. Privation of vitamin E plays a specific role in the causation of some types of amyotrophic lateral sclerosis but other factors also operate in an as yet unknown manner. 3. Synthetic vitamin E (alpha-tocopherol) and natural vitamin E act specifically in some cases and bring about varying degrees of improvement, perhaps in inverse ratio to the age and duration of the disease process. Some cases, for reasons not yet clear, fail to respond despite intensive treatments. 4. Dietary deficiency, gastrointestinal and hepatic diseases, probably absence of other vitamins may play causative roles: Some of the evidence points to interference with the absorption of vitamin E. 5. There is evidence pointing to the probability of vitamin deficiency in the causation of other degenerative diseases and to the need of specific vitamin treatment if treatment is to be effective and scientific.

Acacia For the Nephrotic Syndrome

Goudsmit and Binger (*Arch. Int. Med.*, 1940:66:1262) of the Mayo clinic reports on the study of the results of acacia treatment in 40 adult patients. In œdema of nephrotic type the serum proteins are diminished—this is the common finding both in cases diagnosed as lipoid nephrosis and in cases of glomerulonephritis in subacute stage with persistent œdema. This explains the rationale of the high protein diet, of intravenous acacia and more recently of injections of concentrated human serum. The author used a 6 per cent solution of gum acacia in 0·66 per cent sodium chloride. The solution is prepared very carefully to prevent reactions. The solution is administered intravenously in doses of 500 c.c., forty five to seventy five minutes being taken for injection and the injection is repeated every day or every other day until a total dosage of 60 to 100 gms. of acacia (½ to 2 gms. per kg body weight) is reached. The other accessory measures to be adopted are: a high protein, salt-free diet, restiriction of fluid to one litre or less and the adminstration of diuretic salts, the one generally used being potassium nitrate in doses of 6 to 12 gms. daily given in ½ gm. capsules and begun 3 or 4 days before the injection treatment. In this series of 40 cases treated only 4 failed to respond and failures were due to the use of insufficient diuretic salts or in-

sufficient acacia and to combat anorexia and vomiting occurring in these patients. The only undesirable effects were urticaria, thoracic discomfort and fever but these were never serious. The ill-effects noted by other observes, *viz.*, the enlargement of the liver were not noted in these cases and this enlargement was due probably to excessive amount of acacia used or to lack of care in its preparation. A second course of treatment, if necessary, can be given after an interval. The results thus obtained are highly encouraging and justify the further trial of the method specially in obstinate cases.

Vaccine Treatment in Rheumatoid Disease

Wetherby (*Ann. Int. Med.*, 1941:14:1849) writes that more than 4,000 cases with chronic rheumatoid conditions have been treated with intravenous streptococcus vaccine in the past nine years with the following results: There was no definite fatality from treatment. Of 1194 cases treated by this method alone, 75 per cent seemed definitely improved, 10 per cent questionably improved and 15 per cent unimproved. In a series of 80 patients treated alternately with unknown solutions of vaccine and sterile normal saline solution 82 per cent of the vaccine treated cases seemed clinically improved as compared with 40 per cent of those receiving saline solution (this affords explanation of striking benefit reported by some patients after all manner of procedures). The author contends that this therapy is of value in the treatment of chronic rheumatoid disease but it is by no means a cure-all, that it is ineffective in some cases and should be combined with such general procedures as indicated in each individual case.

The Treatment of Acute Bacillary Dysentery With Sulphapyridine

Reitler and Marberg (*Brit. M. J.*, 1941:1:277) report successful results obtained in 20 cases of acute bacillary dysentery with sulphapyridine treated at the Government Isolation Hospital, Haifa. These cases included Shiga infection 4, Flexner Y 13, Strong 1, Sonne-E 1 and Schmitz 1. The treatment was started on the second day after admission. One gramme of sulphapyridine was given with sodium bicarbonate (to avoid nausea) three or four times daily for two to four days according to the time taken to recovery, (as a rule the drug was used until one day after the motions became formed). The fever usually dropped 24 hours after the administration of the drug and the diarrhœa greatly improved as regards the frequency and character of the stool and after 48 hours stools became normal in all cases (except in 3 cases it took 3 days and in 1 case 4 days.). Toxic symptoms, observed in one Flexner and two Shiga cases, also improved very rapidly. Stools became bacteriologically negative as soon as they became formed. Relapses have not been observed and the incidence of chronic colitis as a sequela will be much less if not prevented by this treatment.

SURGERY

Discharge from the Nipples

Hichey (*Ann. Surg.*, 1941:113:341) reports that of 1,051 patients attending the tumor clinics of two American hospitals because of mammary lesions 88, or 8·3 per cent had discharge from the nipples. In 54 per cent the discharge was bloody, in 20 per cent serous; the remaining discharges were classified as milky, watery or miscellaneous. The lesions responsible for discharge whatever its character, were cancer in 36 per cent, chronic cystic mastitis in 27 per cent and duct papilloma in 10·5 per cent and in the remaining 27 per cent the causes are listed as hormonal dysfunction, inflammatory cysts, fibrous mastitis and miscellaneous conditions. The author regards chronic cystic mastitis and duct papilloma as precancerous conditions and thus 73 per cent of all the patients with discharge from the nipple may be regarded as having cancer or being in serious peril of it.

Role of Vitamin C in Wound Healing

Hunt (*Brit. J. Surg.*, 1941:28:436) has shown that deficiency in vitamin C prevents collagen formation in healing wounds, the proliferating mesodermal cells fail to mature and the healing of the wound as a whole is profoundly disturbed. In a series of 28 human cases studied postmortem 8 showed deficient collagen formation resembling that seen in guineapigs. In these 8 cases there were 5 instances of abdominal disruption and 3 of leakage at gastrointestinal suture lines. Vitamin C in doses of 1 gm. daily for 3 days followed by daily maintenance dose of 100 mg. is considered of greatest impartance in wound healing as the collagen of normally healed wound reverts to precollagen if scurvy supervenes.

The Use of Hypertonic Saline in Surgical Practice

Dodd (*Post-Grad. M. J.*, 1941:17:81) describes several uses for hypertonic saline 30 per cent in doses of 20 to 40 c.c. in surgical practice. These are : (1) in cases of fall of blood pressure in spinal anæsthesia and at major operations, (2) in post operative spinal headache, (3) in cerebral irritative symptoms and mental confusion following head injuries, cerebral operations or after lumbar punctures and (4) in post operative ileus and pulmonary œdema. The rationale of the treatment is the following: the effect of saline is to attract fluid from the tissue spaces in order to dilute the 30 per cent saline to normal saline strength in the blood. If this is regarded as 1 per cent (actually it is less than this) then 20 c.c. of 30 per cent saline is equal to 600 c.c. of 1 per cent saline, so that the tissue must find 580 c.c. of fluid. This raises the blood pressure by filling the blood vessels. It also relieves congestion specially in areas with trumatic and chronic inflammatory œdema. In some patients the chlorides are beneficial while in others the increase in blood pressure improves the circulation and starts the process of return to normal. Only difficulty is the finding of a vein, which disappears with experience and resolution. When given for headache the patient should be warned that it first aggravates the headache but later on there is marked improvement.

The Evaluation of Various Intravenous Medicaments in the Treatment of Shock

McFarland and Counel (*New Orleans M. & S. J.*, 1941:93:353) write that the aim in the treatment of shock should be to restore vascular tone and vascular volume to a normal state as rapidly as possible. The introduction of fluids such as saline, Ringer's solution, glucose, has been a notorious failure in maintaining such a condition. Acacia has been found to be a more

stable medicament but it is being abandoned for its attendant reactionary dangers which are not very infrequent. Though a whole blood transfusion has been used with considerable success there are definite imperfections and shortcomings in the use of this agent. The introduction of human blood serum or plasma seems the natural thing as it contains all the virtues and none of the vices of other intravenous fluid medicaments. Its protein content and osmotic quality re-establishes normal conditions within the extracellular fluid, which is so necessary for the environment of the organism. It is easily obtainable, can be kept for long periods (months), is always ready for immediate use, is free of untoward reactions and can be readily transported as agitation does no harm. With the use of serum it is possible to avoid the emergency blood transfusion which is oft times too late. In severe trauma it can be used prophylactically to prevent the occurrence of shock. It appears and has been reported to be life saving in severe burns that exhibit such a degree of blood concentration. Its use will be a potent medical instrument in times of disaster and war.

The Use of Prostigmin Methylsulphate in Deafness

Alexander (*New Orleans M & S. J.*, 1941:93:474) writes that prostigmin is a stimulant to the parasympathetic nervous system which supplies the mucous lining of the tympanum and auditory tube and it is of value in cases where there is pathology in the tympanum and the auditory tube. Clinically prostigmin has been found useful in several types of conductive deafness, *viz.*, (1) in acute tubo-tympanitis, (2) in the end stage of acute suppurative and non-suppurative otitis media and (3) in chronic catarrhal otitis media with or without tinnitus. Prostigmin should be used as an adjunct to other accepted treatments: tablets of prostigmin bromide may be given three times a day. Patients with acute pathology in the tympanum or eustachian tube, usually do not require more than 3 doses of prostigmin and patients with chronic otitis media with or without tinuitus require several months of treatment, prostigmin being given twice a week. Prostigmin has a definite value in cases of facial neuralgia but is of no use in osteosclerosis or nerve deafness. No contra-indications were found in the series reported by the author and two cases only complained of nausea and that too disappeared after taking some food.

OBSTETRICS AND GYNAECOLOGY

Toxaemias of Pregnancy

Huber (*Nebraska State M. J.*, 1941:26:77) writes that the toxæmias of pregnancy are the chief causes of maternal mortality in the state of Nebraska and the mortality and morbidity associated with them can be reduced by early detection and adequate control. The earliest sign of a developing toxæmia will be recognised by carefully checking upon the weight, blood pressure and urine of the prenatal patient. The weight gain throughout should not exceed 25 pounds; the rate of gain is more significant and if excessive will give early evidence of the retention of fluid and a disturbed metabolism, the normal gain in weight being never more that one and one half pounds per week. An increase in systolic pressure of 30 m.m. Hg or more or a systolic pressure of 130 mm. or above should be viewed with suspicion and albuminuria in the abscence of urinary tract infection should be considered presumptive evidence of toxæmia. Immediate institution of management along conservative lines, decisive action when control of the symptoms is no longer possible or advisable without regard to duration of pregnancy, termination of pregnancy by conservative means, careful postnatal follow-up to determine the presence of permanent damage to vasculo-renal systems and prevention of repeated pregnancies where there is evidence of permanent damage are some of the principles the adoption of which will reduce the maternal mortality and morbidity.

The management of eclampsia is also primarily medical and intervention is not justified until the convulsions are controlled and a diuresis is established. The convulsions are controlled by any two of the following drugs: (1) Luminal-sodium: 5 grains subcutaneously every 8 to 12 hours; (2) magnesium sulphate: 10 c.c. of a 25 per cent solution and 5 c.c. after every convulsion; (3) morphine sulphate: ¼ grain every hour until convulsions cease or respirations are below 12 per minute; (4) chloral hydrate: 30 grains in 100 c.c. of starch water as a retention enema every 6 to 12 hours. Diuresis is started by the intravenous use of 1,000 c.c. of 20 per cent glucose in distilled water every 8 hours, given within a period of 40 to 60 minutes. A retention catheter should be inserted and a urinary volume of at least 30 c.c. per hour obtained or more concentrated glucose should be used. With control of convulsions and establishment of diuresis, labour may be hastened or induced by rupture of the membrances with or without insertion of a bag, dependent on the condition of the cervix. Delivery by cæsarian section is contra-indicated except in some other definite indication.

Should Solution of Posterior Pituitary Be Used in the First and Second Stages of Labour?

Sharkey (*J.A.M.A.*, 1940:115:16) summarizes in the following lines conclusions about the use of drug in normal labour, uterine inertia and complications of pregnancies:

Normal labour. The use of the drug in normal labour may be attended with grave consequences, *viz.*, it may be the cause of intracranial hæmorrhage in the baby, and there is the danger of deep cervical and perineal lacerations, injuries to the birth canal, premature separation of the placenta, postpartum hæmorrhage, shock and collapse and finally rupture or the uterus. Its use should thus be condemned in normal labour.

Uterine inertia. The drug is helpful in cases of true primary inertia which may occur in elderly primiparas of emotional type, in elderly multiparas with long intervals between pregnancies, in women whose obesity arises from endocrine dysfunction, in anæmic or asthenic women, in chronic invalids, in those convalescing from acute infections and in those under-nourished from hyperemesis gravidarum. The drug should not be used when uterine inertia is due to the following mechanical causes: (1) generally contracted pelvis, (2) abnormal position of the fœtus as persistent occipitoposterior, breech, shoulder, face or deep transverse arrest of the vertex, (3) tumors of the uterine wall or other tumors in or near uterus blocking the birth canal, (4) congenital anomalies such

as bicornate uterus or infantile uterus, (5) abnormal positions of the uterus, as retroflexion or anteflexion with pendulous abdomen, (6) great multiparity causing thinning of the uterine wall with the danger of spontaneous rupture of the uterus, (7) overdistension of the uterus as in polyhydramnios and in multiple pregnancies, (8) scars on the uterus from previous operations of disease of the uterine wall, (9) dystocia, dystrophia syndrome, and (10) rigid and undilatable cervix. In secondary inertia the drug should not be used when the uterine muscle is exhausted after many hours of hard labour (sedatives, rest and maintenance of nutrition should prepare the patient for operative delivery). In cases of weak uterine contractions if the presentation is normal and rotation completed it is wise to use low forceps but where there are no facilities for this operation posterior pituitary may be used in certain cases in lieu of low forceps, specially in multiparas and in doses of 1 or 2 minims.

Complications of pregnancy. Posterior pituitary should not be used in toxæmias of pregnancy, placenta prævia and in serious heart disease. In abruptio placentæ, solution of posterior pituitary in conjunction with the abdominal binder is recommended but it should be given carefully. The dose should never exceed 3 minims and 1 minim is preferable and intervals between doses should be at least 30 minutes.

The Treatment of Puerperal Sepsis

Brown (*Nebraska State M. J.*, 1941:26:91) writes that puerperal infection is caused not only by the presence of bacteria in the genitalia but also by opening up of portals of infection through trauma and lowering of resistance by exhaustion and hæmorrhage. The correction of dietary deficiencies during pregnancy, particularly anæmias and protein deficiencies is of utmost importance in preparing the patient to overcome any infection that she may develop. The use of masks in labour room has certainly reduced the incidence of droplet infection in hospital cases but in home delivery the question of infection through attendants has not been sufficiently tackled with. There are are some active prophylactic procedures which significantly reduce not only number of infections but also the severity of and the morbidity from these infections. To be effective these agents should be given immediately following delivery before infection has been made manifest. These include (1) transfusion of either (normal or immune) blood to replace blood and to bolster the body's defence mechanism against infection by stimulating hæmatopoiesis and phagocytosis; (2) oxytocic drugs (ergot and pituitrin) by expelling the fragments of placenta and membranes and keeping the uterus free of blood clots which serve as excellent culture media for the growth of the bacteria; (3) sulphanilamides for the bacterostatic action. These should be used prophylactically in all difficult labours where complications in the puerperum are feared or anticipated. The treatment of the septic patient should aim (1) to localise the infection in the pelvis by Ochsner regime which includes semi-Fowler's position, nothing by mouth, parenteral fluids, sedation and heat to the abdomen; (2) to combat sepsis by supporting measures, transfusion and sulphanilamide and (3) to treat any complication by the usual medical and surgical means as indicated. In acute pelvic infection the patient should be examined frequently to ascertain the development of a localized collection of pus in pelvis or metastatic abscess and if an absscess forms in the pelvis it is best drained by the pouch of Douglas. Treatment of chronic pelvic inflammatory process consists of rest, heat, foreign protein and as a last resort, surgery. The thrombophlebitic process responds to heat, elevation and rest. Ochsner's new method of blocking the sympathetics by novocaine has produced dramatic results in those cases. Metastatic abscess and toxic visceral damage require the usual medical and surgical treatment.

TROPICAL MEDICINE

Some Basic Principles in Leprosy Treatment

Muir (*Leprosy Review*, 1940:11:162) writes that the nerve type cases show high resistance of the tissues with intense cellular reaction and the lepromatous type shows rather abscence of resistance and in the latter type the aim of treatment should be to strengthen and stimulate the tissue cells to act more vigorously in breaking down the defence of the bacilli and this is achieved by improving the general health by regular exercise. Local application of caustics such as trichlor acetic acid, intradermal injections of hydnocarpus oil and nutritious diet are recommended. Potassium iodide in small doses at first has a specific effect in breaking down the defence mechanism of the bacilli. Fluorescin in 10 grain doses for 7 months, methylene blue 4 grains for six months or tryphan blue 4 grains for over one month may be used with benefit but the author forbids their use in massive doses.

Intranasal Treatment in Leprosy

Muir (Leprosy Review, 1940:11:173) recommends the following treatment for diminishing the discharge of leprabacilli from the nose: (1) Irrigation of the nasal cavities with normal saline with a pipette with an addition of 0·9 per cent ephedrine hydrochloride if there is much discharge; (2) if there is severe sepsis with pus and crust the same irrigation with normal saline but for longer duration or with 10 per cent solution of sodium sulphate to soften the crusts; (3) for dealing with leproma cauterisation with 10 per cent solution of trichlor acetic acid after the mucous membrane has been anæsthetized with 2 per cent novocaine (this process of cauterisation is to be repeated).

The Effect of Wheat Diet on Relief of Certain Painful Complications and Sequelae of Leprosy

Cochrane and others (*Indian J. Med. Res.*, 1940:27:963) after two years' investigation of certain diets in leprosy observe that wheat diet is effective in relief of painful neuritis and certain distressing bone and joint poins refractory to conventional therapy. The results obtained are encouraging and justify further trial of the diet for relief of pain in leprosy.

Treatment of Hookworm Anaemia

Napier and others (*Indian M. Gaz.*, 1941:76) observe that anæmia in hookworm disease is due mainly to blood loss. Some other minor factor due to failure of absorption as a result of intestinal mucosal dysfunction has also been suggested. Basing

on the results in 36 cases the authors write that anthelmintic treatment without iron is of little immediate value, that even in extreme anæmic cases treatment with iron alone raises the hæmoglobin value to normal but to maintain this level worms must be removed, that slightly better results are obtained if iron treatment is begun after deworming but this difference does not justify the risk of treating a patient with a very low hæmoglobin index with anthelmintics and that the addition of copper and manganese to iron has no special advantage in these cases. In severe cases two courses of iron therapy (3 weeks in each) are necessary with anthelmintic therapy (4 c.c. of tetrachlorethylene) in the intervening period. Ferrous ammonium citrate in dextrose solution is a more efficient preparation than ferrous sulphate in tablet form.

Modern Treatment of Intestinal Parasites

Manson-Bahr (*Practitioner,* 1941:146:271) deals with the subject under the heads of nematodes and cestodes.

Nematodes—Ascaris lumbricoides. *Santonin* is the most widely used drug, given in doses of 5 grains with calomel 2 grains on three successive nights followed by a saline purge six hours afterwards. The ill effects are diarrhœa, vertigo, yellow vision, nausea and in extreme cases convulsions and coma. Urine is colored green or yellow when acid, purplish or red when alkaline. *Oil of chenopodium* is more effective but extremely irritating to skin and mucous membrane; its absorption is rapid and in large doses it causes depression of the respiratory centre; contraindicated in cardiac, hepatic or visual disorders. The drug is put up in hard gelatin capsules, each containing 3 minims and the routine dose is 24 minims, *i.e.,* 8 capsules are given in 2 lots at ½ hour interval followed by a saline purge ½ hour after (to get rid of the unabsorbed portion of the drug and to expel the partly paralysed worm). The children's dose should be 1 minim for each year of age upto 16. *Carbontetrachloride* causes damage to the liver and should not be used in cases of alcoholism, cirrhosis of the liver, renal or respiratory diseases and during the course of fever. The dose for an adult is 60 minims given in hard gelatin capsules each containing 30 minims of the drug; the minimal dose is 3 minims and it should be increased by that amount for each year upto maturity. It is best given in the morning on empty stomach preceded the night before by ½ ounce of sodium sulphate and its use should be followed within ½ hour by an equal amount. *Trichlorethylene* is the same in dosage and has a pleasanter taste and odour than carbon tetrachoride. *Hexylresorcinol* may be used in the similar manner as in ankylostomiasis. *Phenothiazin* a dye of the methylene blue and thionin group has been found effective by the author in human ascaris infection, probably more so than any other form of treatment. The dosage is 8—10 gm. made up with bile salts in tablet form (Imperial Chemical Industries). The drug is to be given early in the morning daily for ten consecutive days and then should be followed by a saline aperient. No special preparation for the patient nor any dietetic restrictions are necessary; no ill after effects; the urine is colored pink 20 minutes after administration.

Ankylostomiasis. *Thymol.* Adult dose is 60 grains in males, 45 grains in females, 8 grains for children under five, 15 grains for children between five and ten and 30 grains for children between ten and fifteen. It is toxic and should not be given more than once a week and then on empty stomach followed within an hour by a saline aperient (the patient should have a special dietetic preparation one day before treatment). *Betanaphthol* in doses of 3 to 10 grains is given in the same way as Thymol, but it is apparently less efficacious. *Oil of chenopodium* is more efficacious. The dose and the method of use is the same as in ascaris infection and the drug should not be repeated before a week. *Carbontetrachloride* should be employed in the same manner as in ascaris infection taking all possible cares. *Tetrachlorethylene* is less toxic and used in the same way as in ascaris infection but is not quite satisfactory. *Combined treatment of carbontetrachloride and oil of chenopodium* has given good results. Preparation for one day, a saline purgative administered the night before and one hour afterwards. The dose recommended is carbontetrachloride 40 minims, oil of chenopodium 17 minims, liquid paraffin (excipient) 1 ounce and this is conveniently given in two halves with 15 minutes interval. *Hexylresorcinol* (caprokol) is moderately efficacious in eradicating hookworms and is also used in threadworm infection; is given in hard gelatin capsules or crystoids. It is relatively non-toxic and there is no interference with the daily routine.

Whipworm. A certain numbers can be dislodged by the mixture of carbon tetrachloride and oil of chenopodium. Faust asserts that the fresh latex of *Ficus glabrata* taken on empty stomach in 2 ounce does removes the parasites.

Threadworms. *Quassia* enemas with infusion of quassia (1 in 40) with quassia per mouth in the form of 'quassin' tablet are useful. *Butalan* (Bayer) given per mouth has proved only partial success (3 times a day for one week) *The mixture of carbon tetrachloride and oil of chenopodium* though may dislodge the worms but is too toxic for children. *Hexylresorcinol* (15 grains) in enteric coated tablets daily for 14 days or longer supplemented by high enemas of the same in 0·1 per cent solution (8—12 ounces) to be retained for 10 to 20 minutes. The course of treatment is to be repeated every 3 or 4 weeks. *Gentianviolet* is employed in enteric coated tablets (1 grain) three times a day daily before meals for 16 consecutive days or for two periods of eight days each with a week's rest between. For children the daily dose recommended is 1/6 grain for each year of age. Nausea and discomfort may develop in some cases *Phenothiazin* is the most easily administered and most efficient method at present available according to the author. For children between 5 and 10 the dose is 1 gm. a day for 10 consecutive days; for below 5, ½ gm. suffices. The adult dose is 8—12 gm. The urine is colored pink.

Strongyloides strecoralis. Delegan has shown that gentian violet in doses described above is lethal to the parasitic female strongyloides.

Cestodes—The commonest and most widely spread, *T. saginata* has proved most difficult to eradicate although unprovided with hooklets. *D. latum* and *T. solium* are most easy to dislodge. Filix mas treatment and the combined treatment with carbon tetrachloride and oil chenopodium are both successful. *Filix mas treatment*: Preparation of the patient: starvation for 2 days with weak

tea, toast, barleywater, glucose, an aperient such as some preparation of senna each night for two days and an ammon chloride (15 grains) mixture three times a day for two days to clear the bowels of the mucus. Adminstration of the drug: At 8 a.m. on the third day on empty stomach the extract of filix mas (60 to 120 minims) is given in hard gelatin capsules each containing 15 minims; 2 capsules are given with an interval of ½ hour; a saline aperient at 10-30 a.m. and 1 pint of hot water enema afterwards. When the head has appeared the patient may be given a light diet but no alcohol. *Oleoresin of aspidium* in doses of 120 minims (given emulsefied) is also effective. *Pelletierine* 7 grains dissolved in alcohol followed two hours later by 1 ounce of castor oil and a soap water enema, *melon seeds* (700 grains given with honey) on empty stomach followed by a saline purge, *arica nut* (30 gms., powdered and boiled in 200 c.c. of water for 30 minutes), the *mixture of carbon tetrachloride and oil chenopodium* as given in ankylostomiasis are some of many effective drugs used in these conditions. It is emphasized that when once numbers of segments have broken away with any form of treatment and the head still remains in the host, further drug treatment is invariably unsuccessful until the worm has grown to an appreciable length which is usually after an interval of six weeks or longer. This knowledge will help in doing way with unnecessary treatment with filix mas which in excessive doses produce bilirubinæmia, jaundice and eventually cirrhosis of the liver.

Hymenolepsis nana, is most difficult to dislodge. Maplestone and Mukherjee have found gentian violet effective in dislodging it. Faust recommends oleoresin of aspidium, oil of chenopodium and hexylresorcinol.

SYNTHETIC ORGANIC DRUGS AND THEIR PRODUCTION IN INDIA

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In any review on the modern synthetic organic medicaments it would be preferable to classify them according to their therapeutic use rather than their chemical nature as a slight alteration in the chemical composition often changes the pharmacological characteristics of the compound to a considerable and divergent degree. For convenience they may be divided into three categories—(*i*) those used for general treatment, (*ii*) those found useful as chemotherapeutic agents, and (*iii*) those produced for replacing the active principles of biochemical nature.

Drugs for General Treatment

(*a*) Anæsthetics:—Ether and chloroform are most widely used and these are being produced in India. In cyclopropane and divinyl oxide the anæsthetist would find certain advantages but uptil now they have not yet become so popular. Diethylamino ethyl p-amino benzoate hydrochloride (Procaine) has largely replaced the natural product, cocaine, for infiltration anæsthesia. But systematic research is still wanted for finding out a product for topical application that would directly penetrate the skin, and one that would nullify the concomitant use of a vasoconstrictor for producing constriction of the capillaries. Further, a good anæsthetic should be readily soluble in water, relatively non-toxic, stable during sterilisation, non-irritating and also compatible with other adjuvants. Such types of compounds are rare.

(*b*) Analgesics and Antipyretics:—Antipyrine and its amido derivatives are useful medicaments but they are not so effective as morphine. An effective, nontoxic and non-habit forming synthetic product is still to be discovered. Phenacetin is again a very popular antipyretic. Compounds of this nature are not being produced in India.

(*c*) Antispasmodics:—Various synthetic products are being introduced to replace atropine and papaverine. But an antispasmodic that would relieve spasms of all types of smooth musculature, is yet to be synthesized.

(*d*) Aperients and Diuretics:—In this group no single product is being found so very efficacious. Phenolphthalein is largely used, but recently 1:8-dihydroxy anthraquinone (Istin) has been introduced. Mersalyl (a complex mercury derivative) is also being used as a diuretic. The popular drug, 2-phenyl quinolinic acid (Atophan) is now being manufactured in India from the natural colouring material, indigo.

(*e*) Hypnotics:—In barbituric acid derivatives the modern clinicians would find a hypnotic that may react rapidly or slowly, or, act over a short or long period of time. Research has been conducted in certain laboratories in India to reproduce some suitable barbituric acid derivative but for a commercial production various other problems are to be solved before a drug may be introduced into the market. Urethanes ($C_2H_5CH_2NO_3$) are also used, but recently a cumarin derivative (diethyl amide of coumarin 3-carboxylic acid) is being found to possess a pronounced narcotic activity.

(*f*) Stimulants and Pressor agents:—The widely used products, strychnine, camphor, caffeine, adrenaline, ephedrine, digitalis and posterior pituitary are all obtained from natural sources. Camphor, adrenaline and ephedrine are, however, being synthetically produced in other foreign countries. Attempts may be made to synthesise one or other derivative of β -phenyl etheylamine which is the active group of the well-known drug adrenaline, ephedrine or benzedrine. As circulatory and respiratory stimulants pentamethylene tetrazole and diethylamide of nicotonic acid are largely used and it is not definitely known to the author whether these medicaments are really being manufactured in the country at present.

(*g*) Vasodilators:—Cholin Chloride, $(CH_3)_3N\ Cl\ C_2H_4OH$, lowers the blood pressure. So researches are being conducted to obtain one or other derivative of this interesting compound. On the other hand certain esters like benzyl benzoate and amyl nitrite have also certain uses. Amyl nitrite in bulbs is now being locally produced.

(*h*) Germicides:—For various purposes we require certain compounds that may retard the growth or kill the micro-organisms. Acid carbolic is the most common medicament. This as well as various cresol derivatives are available in India. But in pharmaceutical industry more potent germicides like phenyl mercuric nitrate, chloro cresol, are wanted. Similarly, agents that may prevent the growth of fungi in very high dilution would have a wide market at the present time.

Chemotherapeutic Agents

Chemists have handed over to the clinicians a number of compounds for the treatment of their patients against various infections. But the knowledge that may predict what specific grouping will bestow upon a particular compound a preferential affinity for any invading organism, is very scanty. This is mainly for the fact that nothing definite is known about the chemical alteration of a drug that takes place under the influence of the living matter and the micro-organism. For all these an idea on the structure of the protoplasmic material of the body tissues and of microbe cells is necessary. Otherwise one will have to roam in the wilderness before he may succeed in isolating any product of commercial importance as noted below.

(*a*) Anthelmintics:—There are various indigenous remedies against hook-worm and other similar infections. Thymol, the active principle from ajowan, has been synthesised and is also largely used. The recently-discovered product, hexyl resorcinol, is gradually finding a market. Attempt may be made to isolate a product that may act against filariasis.

(*b*) Anti-bacterials:—For local applications various dyes—methyl violet, methylene blue, acriflavine, proflavine, have been used for a long period of time. Hexamine, mandelic acid, mercurochrome have also useful application. The recent discoveries of the sulphanilamide group of drugs have really brought forward a number of medicaments for combating various bacterial infections. Certain products of this group are also being manufactured in India. Though the various sulphanilamide derivatives so far synthesised possess greater value as chemotherapeutic agents than any other group of drugs developed since the synthesis of arsenicals of the arsphenamine group, still derivatives or compounds are to be discovered that might be effective in typhoid, tuberculosis or similar other dreadful disease. In tuberculosis gold compounds are often used. A compound of this nature has been successfully prepared in one commercial laboratory of India.

(*c*) Amœbicides:—Acetarsol, "Yatren", and p-carbamino phenyl arsenic acid are often used. The last-named compound is locally available. But research for a synthetic product that may replace the natural drug emetine is essential.

(*d*) Spirocheticides:—Organo arsenic and bismuth derivatives are generally preferred. Amongst the former sodium arsanilate, sulpharsphenamine and neo-arsphenamine are usually used. The sulpharsphenamine is manufactured in India. Bismuth therapy is again adopted as a good adjunct to arsenic therapy. But for this a proper concentration of the metal in the body fluid is always to be maintained. The usual drugs are metallic bismuth, colloidal bismuth or some form of bismuth in oily suspension. All these are being produced in India. For better absorption of the metal an acidic bismuth in stable form would be more desirable.

(*e*) In Leishmaniasis:—The antimony compounds were all along being used, but the discovery of "Urea-Stibamine" in India has led to further research in this direction. A compound of definite constitution and of much lower toxicity will have to be found out for its safe use in Kala azar.

(*f*) Anti-malarials:—For reasons well-known extensive investigations have been carried out in different laboratories of various countries to find out suitable medicaments that may combat against the malarial parasites. "Atebrin" and "Plasmoquin" are the only products that have ever established themselves in the market. The former has also now been prepared in more than two laboratories in India and a firm has now contemplated to transplant its successful laboratory work to commercial large scale production.

In the search for any anitimalarial compound the difficulty is being felt for the scanty knowledge as to why and how anti-malarial drugs exert their activity. A preliminary idea of the anti-malarial activity of any new synthetic product may, however, now be gathered from experiments with Java sparrows and canaries. In India again a research institution is seldom equipped to carry out such work in bird malaria and to assay a new product by the recent Roehl's technic. But the quest for an anti-malarial drug would still continue as an ideal anti-malarial would be active against all the malarial parasites at their various stages, be less bitter, but cheaper, and would not exert any side or untoward reaction. For this attention may even be diverted to the syntheses of various 6-methodoxy quinolyl ketones or alcohols instead of concentrating all the ideas on the production of a complex amino derivative of the quinoline or acridine type.

Bio-Chemical Products

It is difficult to conceive of any development which has been of greater benefit to the human race than what has been achieved mainly by the combined efforts of physiologists and chemists in the development of vitamin and endocrine gland therapy. Our ideas are being constantly changed, and newer discoveries are being made from day to day. The syntheses of various vitamins (mostly on commercial basis) and the sex hormones tend to establish the ingenuity of the modern organic chemists. Thiamine chloride (vitamin B_1), riboflavine (vitamin B_2), nicotinic acid amide, 2-methyl-3-hydroxy-4 : 5-dihydroxy ethyl pyridine (vitamin B_6), ascorbic acid (vitamin C), and 2-methyl-1 : 4-naphthoquinone (possessing the anti-hæmorrhagic activity like vitamin K) may be regarded as true synthesised products. Taking again cholesterol as the starting material vitamin D_3 (identical with the natural vitamin D as present in fish liver oil), and testosterone (the male sex hormone) have been successfuly synthesised in large plant scale. Ergosterol again has yielded two products—Vitamin D_2 (Calciferol), and Oestrone (the female sex hormone). Though the latter is not being made on commercial basis, two products are now available which are more potent than the natural œstrone and for whose production one will not have to depend on natural sterols, urine or the like. These are diethyl stilbœstrol and hexœstrol—two simple organic compounds. Stigmasterol from soyabean oil has again afforded two natural products—progesterone (corpus luteum hormone) and desoxy-corticosterone (the more potent principle of the adrenal cortex). Since the synthesis of the latter

compound it is being successfully used in the treatment of Addison's disease.

It has not yet been possible to synthesise another member of this steroid series—the cholic acid—as present in the natural bile salts, sodium tauro- and glycocholates. This characteristic natural acid on oxidation gives dehydrocholic acid which is being commercially prepared and successfully utilised in hepato-biliary disorders. Apart from all these natural products attempts have been successfully made in the synthesis of the active principle of thyroid (thyroxine) and that of adrenal medulla (adrenaline). It is still a question whether the synthetic thyroxine can replace the active principle of thyroid, but it is definite that synthetic l-adrenaline has completely replaced the sympathomimetic substance as present in the natural suprarenal gland and as a result natural adrenaline is now-a-days obsolete.

Barring the production of dehydrochloric acid most probably no other product of this interesting series has yet been commercially produced in India. There are various difficulties indeed, and it is reported that researches have already been successfully carried out for the production of vitamin D_2 and thyroxine in certain research institutes of the country.

Conclusion

Action has its reaction. A drug that would cure a disease, may also make a disorder in the system. But the growth of knowledge demands the isolation of a drug without any unpleasant and harmful byeffects. The problem would be to discover a compound that would be absolutely non-toxic to the host but specific in its clinical application. This has not yet been possible in most of the cases, and inspite of the extensive investigations for the last 40 years or more, no comprehensive theory has been established for formulating a relationship between the specific physiological action and the chemical constitution of any synthetic organic medicament. Besides, there are fields where more attention should have been, or, be drawn from national and eonomic points of view.

The reflection that may be cast after making any survey on the development of the synthetic drug industry in India, is not so gloomy as it appears. It must be remembered that like most other humanitarian work whatever is being done in India is due mainly to private enterprise. This is being further checkmated by scarcity of basic materials, difficulties in bioassay and want of suitable mechanical appliances. For the solution of the problem is further required greater co-operation amongst various groups of scientists, collaboration between different types of research laboratories, and a sympathetic feeling amongst the members of various professions. A slight co-operation from the hospital authorities for assaying the medicaments that are being produced in India would create wonders as guidance in our efforts to obtain synthetic drugs is generally obtained from a study of the changes undergone by compounds in the organism that often transforms an active compound to one less active, and alters a toxic substance to a harmless one.

NOTES AND NEWS

THE PRESIDENT'S TOUR IN GUJRAT (BOMBAY PROVINCE)

Dr. Chamanlal M. Mehta, Bombay, Hony. Jt. Secretary, I.M.A. gives in the following lines a report of the recent tour in Gujrat by the President, I.M.A.:—

Dr. K. S. Ray, President, Indian Medical Association, at the time of his visit to Bombay to attend the Working Committee meeting, took the opportunity of touring through Gujrat.

Bulsar: Accompanied by Dr. Chamanlal Mehta, Jt. Hon. Secretary, Dr. Ray left Bombay for Bulsar on the 28th July, 1941. Drs. Navalkar, Pragji Desai, Sanjanwala, C. K. Desai, and Dr. Mrs. Dholabhai received them at the station. They were the guests of Dr. Mrs. Dholabai. A meeting of all practitioners of Bulsar and a Tea party were arranged in the evening at Dr. Mrs. Dholabhai's bungalow. After the meeting was addressed by Drs. Ray and Chamanlal, a Bulsar Branch of the Indian Medical Association was inaugurated with Dr. Navalkar as the President and Dr. Sanjanwalla as the Hon. Secretary. They left Bulsar the same night.

Surat: Dr. Karsukh V. Hora received them at the station. In the morning of the 29th July 1941 accompanied by Dr. Hora, they visited some prominent medical practitioners in the city. A meeting and an At Home were organised by the Surat Medical Union in the hall of the Union and were presided over by Dr. Vijayakar, the President of the Union. After Dr. Ray was introduced to the members, he addressed the meeting on the need of the unity in the medical profession and the growth and work of the Indian Medical Association and stressed the necessity of converting their Surat Medical Union into a Branch of the Indian Medical Association. After the members asked some questions on the subject, Dr. Chamanlal explained to the meeting the working of the Indian Medical Association and the position of a Branch in relation to the parent body. Drs. Contractor, Dixit, Patel and others expressed their views favouring the conversion of their Union into a Surat Branch of the Indian Medical Association. Dr. Vijaykar, thanking the guests, said that the general sense of the meeting was in favour of converting themselves into a Branch of the Indian Medical Association and he requested the Hon. Secretary, Dr. Hardhvala to convene a special meeting for the purpose as early as possible. On the 30th July they visited a number of public medical institutions in the city, important amongst them being the Hindu Maternity Hospital, Tuberculosis Hospital, Leper Asylum and Ashaktashram (Infirmary). The guests left for Ahmedabad in the afternoon and were seen off by Dr. Karsukh Hora.

Ahmedabad: Dr. R. M. Fozdar, the President of the Ahmedabad Medical Society, (Indian Medical Association, Ahmedabad Branch) and Drs. Shah and Vyas Hon. Secretaries received Drs. Ray and Chamanlal at the station in the early hours of the 31st July, 1941. A very crowded and interesting programme was arranged. The President was the guest of

Dr. Fozdar. In the morning a visit to a number of public medical institutions was arranged. The guests went round to the Municipality Maternity Home, Civil Hospital and Vadilal Sarabhai Hospital and Chinai Maternity Hospital. A meeting and a Tea party were organised in the afternoon at which both Drs. Ray and Chamanlal spoke on the activities of the Indian Medical Association and requested the Ahmedabad Branch for their more active support. Dr. Chamanlal stressed the necessity of organising more branches in Gujrat and Kathiawar and asked if the work could be taken up by the Ahmedabad Branch, it being the strongest in that part.

After having a very pleasant sight seeing drive in the evening the guests were entertained to a Dinner at night at the Grand Hotel, where over 60 covers were laid. They left Ahmedabad for Baroda in the morning of the 1st August and were seen off at the station by Drs. Fozdar, Shah and Vyas.

BARODA: Dr. Ray was treated as the State guest at Baroda. In the forenoon they went round the State General Hospital and met Dr. Chandrachood and Dr. Nanavati, the President and Vice President of the Baroda Medical Union and some general practitioners in the city. The meeting of the Baroda Medical Union and an At Home were arranged in the evening at which Dr. Ray and Chamanlal addressed the medical practitioners of Baroda. The main difficulty in converting their local Union into a Branch of the Indian Medical Association was the contribution of Rs. 3/- per member per annum which was considered too high, but after the working of the Indian Medical Association and the priviliges regarding the journal etc. were explained, the members were convinced that the contribution was not high and they promised to convert their Union into a Branch of the Indian Medical Association at their next meeting.

After spending a day at Baroda for sight seeing, Drs. Ray and Chamanlal left Baroda on the 3rd for their respective places. It was realised that such tours by the President of the Indian Medical Association to different parts of the country would strengthen the Indian Medical Association very much. It brought about close contact with the Branches and stimulated them to take active part in the Indian Medical Association.

MAHARASHTRA & KARNATAK MEDICAL CONFERENCE

The Sixth Maharashtra and Karnatak Provincial Medical Conference will be held at Poona, under the auspices of the Poona Branch of the Indian Medical Association on the 13th, 14th and 15th October, 1941. The main subject for discussion is "Blood-pressure in health and disease." Papers on other medical subjects will also be read and discussed. An exhibition of medical products, surgical appliances and interesting specimens is being arranged. All medical practitioners in the Province are cordially invited to attend the Conference.

RECRUITING FOR I.M.S.

The informal two-day Conference on recruitment to the Indian Medical Service, which concluded on the 22nd July, 1941, under the chairmanship of Sir Girja Shankar Bajpai, considered the terms and conditions of recruitment to the service and came to a number of conclusions, which are briefly summarised in a Communique as follows.

Greater publicity should be given:—

(*a*) To the existing terms and conditions for Emergency Commissioned officers of the Indian Medical Service, to bring out the fact that they involve no discrimination between European and Indian entrants in regard to rank, emoluments, promotion or other conditions of service; and

(*b*) To the fact that for the period of the war, no new permanent appointments will be made to the Indian Medical Service.

The procedure for recruitment should be decentralised and adequate machinery for the purpose should be set up in the Provinces. It was accepted that in the Major Provinces the Selection Board should consist of five members, two of whom would be non-officials while in the minor Provinces the Board would consist of three members, one of whom would be a non-official.

Central Advisory Body—A Central Advisory Body should be set up which would review the progress of the arrangements now proposed for improving recruitment and make recommendations when necessary. This Central Advisory Committee should consist of five members, three of whom would be ex-officio, *viz.*, Director-General, Indian Medical Service and the secretaries of the Defence and Education, Health and Lands Departments, and two private medical practitioners.

Further proposals to make the conditions of service more attractive especially for medical practitioners of some years standing, were put forward and will be examined by Government.

The Conference finally recommended that a percentage of Permanent Commissions in the Indian Medical Service after the war should be reserved for Emergency Commissioned Officers who have rendered approved service.

Some of the non-official members of the Conference suggested that the Civil side of the I. M. S. should cease to exist but it was pointed out that this question impinged on the Constitutional field and the suggestion could not, therefore, be considered during the war.—*Associated Press.*

MEDICAL CONFERENCES TO BE HELD AT ONE PLACE AND TIME

Dr. N. A. Purandare arranged a Dinner at the Cricket Club of India, Bombay at 8-30 p.m. on Saturday the 26th July, 1941, to discuss informally and exchange views on the question of holding the meeting of the various All India Medical organisations at one place and one time.

Dr. K. S. Ray, Dr. Mrs. Dadabhoy, Dr. Jivraj Mehta, Capt. P. B. Mukerji, Dr. R. N. Cooper, Dr. C. N. Shroff, Dr. B. N. Vyas, Dr. R. P. Ratnakar, Dr. H. De Sa, Dr. Narayan Rao, Dr. Chamanlal Mehta and Dr. B. N. Purandare were present amongst others.

After the dinner, Dr. N. A. Purandare opened the subject and said that to him it appeared to be very advantageous both to the specialists and the general practitioners to have

these conferences held at one place and one time. He was one of those who enthusiastically supported the resolution moved by Dr. Chamanlal Mehta at the 3rd All India Obstetric & Gynæcological Congress to the effect that the Committee of Representatives be appointed to meet those of other organisations to meet together and find out the advisability and feasibility of holding the conferences together at one place. The resolution was passed and Dr. A. L. Mudaliar, Dr. S. N. Bagchi, Dr. B. L. Kapoor and Dr. Chamanlal Mehta were appointed as the representatives of the Obstetric & Gynæcological Congress to meet those appointed by other organisations and report at the next session of the Congress. There were three objections raised during the discussions: (1) It was likely that this was a move to have the specialists' organisation merged into the Indian Medical Association. Indian Medical Association being a big body, the importance of other specialists' organisations might be lost and voice drowned. (2) The Obstetric Congress was biannual and it might not be convenient to fix the venue. (3) The venue selected might not have obstetricians to shoulder the responsibility of inviting the Obstetric Congress. Dr. Purandare said that Dr. S. R. Moolgaokar and Dr. Parmar who though invited could not attend the Dinner, also had raised similar objections.

He then requested the members present to express their views.

Dr. Chamanlal Mehta said that there were some misunderstanding regarding the implication of movement and fear of losing the independence of specialists' organisations which were unnecessarily entertained. He, therefore, thought that it was his duty to explain the subject properly. It was at one of the Bombay Obstetric & Gynæcological Society's Annual Dinners that he made this suggestion. The suggestion was brought home to him by a number of general practitioners and specialists who were interested in the proceedings of more than one conference. "I appreciated the spirit behind it, as I had experienced the same difficulties as they. The response to my suggestion was very encouraging. The Indian Medical Association had not come in then. This suggestion was made in April 1940 and the first opportunity I met of giving some concrete form to my views was the All India Conferencce held in December 1941. The Ophthalmic Congress met at Bangalore a few days before the X'mas 1940. The All-India Medical Licentiates' Association held its sitting at Bombay just before X'mas and had just enough time for some of their members to reach Vizagapatam, where the All India Medical Conference had its session during X'mas. The Obstetric Congress was to meet at Calcutta on the same dates as those of All India Medical Conference. The Obstetric Conference had to be postponed because some of us were anxious to attend the All India Medical Conference. But with the result that I had to go again to Calcutta in April, spend for travelling, lose practice second time within four months, and cause inconvenience to the patients; more time was wasted in travelling than actual time for the Conference. While the obstetricians were meeting in Calcutta, the surgeons were having their session at Delhi. No speciality today can afford to be an absolute water tight compartment by itself. We are interested in advances made in other branches of medical science. By holding the various conferences at far off places and at different times, we make it impossible for a large majority of specialists and general practitioners to attend. I, therefore, moved a resolution at the All-India Conference held at Vizagapatam that it was desirable to have all conferences meet at one place and time and the Central Council, I.M.A., should move in the matter and approach other organisations to discuss the subject and devise ways and means to implement the resolution. There was no intention whatsoever of any amalgamation or undermining the influence and importance of any specialists' organisation. Each can meet under the auspices of its own organisation and quite independently, but only at one place and during the same week, only a few social functions may be common. It would be easy and economical to the people who undertake organising these conferences. The venue can be fixed by a Representative Committee in advance either at an university centre or at a place with a medical school. We have today Universities and a number of medical school towns. I, therefore, appeal to all those present to discuss the subject freely and frankly."

Dr. R. N. Cooper (Surgeon) said that in general he was in agreement with the suggestion. At the Surgeons' Conference, the points mentioned by Dr. Purandare weighed with us in deciding against joining with all the All-India Medical Conferences, but after hearing Dr. Purandare and Chamanlal, he was of the opinion that efforts should be made in this direction. At least a couple of sessions might be held at one place and time as an experiment.

Dr. K. S. Ray (President, I. M. A.) said that he was in agreement with Dr. Cooper in the suggestion that an experiment be made. He said that there were no post graduate courses in India, but these conferences filled up that deficiency to the general practitioners. He was, therefore, in favour of the resolution. His only fear was that if every specialist organisation developed their journal, the Journal of the Indian Medical Association might experience some difficulty. There was no fear of any amalgamation of any organisation with the Indian Medical Association.

Dr. B. N. Vyas (Lucknow) was in agreement with the spirit of the resolution, but he was doubtful if the general practitioner will spare about a week or ten days at a time. He suggested that the place should be big enough to the care of and cater the needs of about four thousand gates and visitors.

Dr. Jivraj N. Mehta (Bombay) stated that the difficulty pointed out by Dr. Vyas could be got over by having the conferences held at places where there were either medical colleges or schools. He thought that holding the various conferences at one place and one time was very necessary. He pointed out that the social side of such conferences should not be neglected.

Dr. R. P. Ratnakar (Ophthalmologist) supported the move very strongly. He was sure the attendance would improve and greater number of medical persons would derive the benefit.

Dr. P. B. Mukerji (Radiologist) supported the suggestion and said that the difficulty of fixing up the venue will be

solved by a joint committee of the various organisations meeting together, and selecting venues for four years ahead.

Dr. Narayan Rao (Licentiates' Asson.) supporting the suggestion said that such a move would be appreciated very much by the general practitioners.

Dr. C. N. Shroff (Ophthalmologist) was in full agreement with the rest that a trial be made to have the various conferences together.

Dr. H. De Sa (Obstetrician) thought that it would not be possible for general practitioners to spare a week or ten days. He was of the opinion that no such move be made just now.

Dr. B. N. Vyas suggested that at Hyderabad the Representatives of various organisations might meet to consider this question.

Dr. Chamanlal Mehta was glad to find such unanimity on the necessity of holding the various conferences at one place and time. He liked Dr. Vyas's suggestion that a Representative Meeting be held at Hyderabad during next X'mas. He thanked Dr. Purandare for his invitation to the dinner and affording an opportunity for discussing the subject. He thanked those present for their free and frank expression of views.

Dr. Purandare thanked the members for responding to his invitation.

BOOK REVIEWS

PATHOLOGICAL HISTOLOGY—By ROBERTSON F. OGILVIE, M.D., F.R.C.P. (Edin.), with a Foreward by A. Murrey Drennin, M.D., F.R.C.P. (Edin.). Royal 8vo. Pages x+332 with 220 photomicrographs in colour. Published by E. & S. Livingstone, 16 and 17 Teriot Place, Edinburgh, 1940.

There is a distinct want for a comprehensive volume dealing with morbid histology. Dr. Ogilvie is to be congratulated for bringing out such a book more so as the pictures are all in colour exactly in the form one sees the object under the microscope. The figures given in text books to be most suitable for the students are generally given as drawings very often a composite drawing of materials from several microscopical fields. It thus becomes fairly easy to illustrate text books by this method than by photomicrographs which give one particular field of the microscope. Ogilvie has selected this very difficult task and has come out of the difficulties by his admirable selection of the field so that the picture shows practically all that requires to be shown. The very large number of figures give the appearance more of an atlas than a text book of pathological histology. The book covers practically the whole range of pathology in words and pictures.

Although it is primarily a treatise on pathological histology, the accounts of naked-eye appearances, though brief, as also the description of the diseased conditions are quite appropriate. It is thus a very useful companion to text books, and can be recommended to both students and teachers.

D. N. BANERJEA.

SULPHONAMIDES IN GENERAL PRACTICE—By M. L. GUJRAL, M.B., M.R.C.P. (Lond.). First Edition, 1941. Crown 16 mo. Pages 106. Published by the author from 1 Curzon Road, New Delhi.

In this small volume the author has compiled almost all the necessary informations about the sulphanilamides. There are 15 chapters and the arrangement of subjects is orderly. Dosage and administration are given in a tabulated form wherever necessary.

The administration of sulphanilamide group of drugs in various streptococcal, staphylococcal, pneumococcal and gonococcal infections has been described by the author very thoroughly. He has also included the treatment of toxic effects during the chemotherapy. The credit of the writer lies in the pages where he has given a critical review of the literature published on the results of sulphonamide therapy in diseases peculiar to the tropics. It may be mentioned that these drugs have been proved to be only partially effective in small pox, plague, actinomycosis and trachoma. In such a book it is always helpful to include the names of sulphonamide preparations by various firms, whose claims have been substantiated in medical practice. We have no doubt that this book will benefit the practitioners and senior students for whom it is intended.

B. P. NEOGY.

ANNALS OF BIOCHEMISTRY AND EXPERIMENTAL MEDICINE, Vol. 1, No. 1, March 1941—Published quarterly under the auspices of the Indian Institute for Medical Research, Calcutta.

This a new publication. The printing and get up of the paper is attractive. It contains a variety of papers in experimental medicine and biochemistry which would be of interest to the readers. The editors are to be congratulated on their initiative and can be trusted to maintain the standard of the publication.

H. N. MUKHERJI.

RECENT ADVANCES IN THERAPEUTICS—Part I, by DR. J. R. GOYAL, M.B., B.S. First Edition, 1941. Crown, 16 mo. Pages 88. Published by the Medical News, P.O. Box 81; Delhi. Price Rs. 2|-.

The author has described in 17 chapters the various indications and contraindications of the sulphonamides. In this group he has included Sulphanilamide, Sulphapyridine and Sulfathiazole. The writer has tried to put before the reader the rather difficult subject of these chemotherapeutic drugs in a short and concise manner. The compilation has been incomplete and does not include any observation by the author. He has quoted freely from foreign journals to show the results of the above drugs in various diseases. Time has arrived when we should start to contribute something of our own at least when writing a book. The subject of Sulphonamides has been widely discussed since 1935. The book does not add any thing new regarding the mode of action nor does it give the treatment of the toxic effects thoroughly. The names of many

wellknown and welltried preparations are omitted for some unknown reason. The man accredited with the discovery of the therapeutic properties of Sulphanilamides is "Domagk" and not "Dogmak" as mentioned in the text. The paper, printing and binding do not reach the expectations although the price of the book is Rs. 2|-.

B. P. NEOGY.

CLINICAL EXPERIENCE WITH UREA SULPHAZIDE. Crown 16 mo. Pages 61. Published by the Scientific Department, Union Drug Co., Ltd., Calcutta.

This book is a compilation of several articles published in various journals of India. Sen and Ghosh claim that they were able to make sulphonamide nontoxic by replacement of sodium by urea in the molecule of prontosil soluble. This has been verified by actual toxicity tests carried out by the authors and supported clinically by some other observers. It has been found by Rosenthal that sulphanilamide solution has no *bactericidal* action on Str. hæmolyticus, but a solution of even 1 in 5,000 has definite bactericidal as well as bacteriostatic effect like sulphonamide. The bactericidal action has been verified by actual experimental observations. The authors found by therapeutic application in a large number of cases that the results of chemotherapy were variable in comparison to serotherapy but the combined treatment gave best results.

In another article, Nandi details his experience on the treatment of 12 cases of puerperal sepsis by urea sulphazide. In none of them, any toxic manifestation was observed, although curative effects have been noted.

Mukherji and his associates give a review of 93 cases of epidemic cerebrospinal meningitis treated with urea sulphazide, M. & B. 693, either alone or combined with serum. They found that urea sulphazide compared very favourably with M. & B. 693.

A few more articles deal with other uses of the drug, including local application in wounds and pyorrhœa alveolaris.

P. GANGULI.

REPORT OF THE TUBERCULOSIS SURVEY SUB-COMMITTEE OF THE INDIAN RESEARCH FUND ASSOCIATION, July, 1940.

This publication consists of two parts. The first part deals with the methods of making a survey and the second part is the report of the sub-committee on classification of pulmonary tuberculosis. Five types of survey are advocated. Type I will ascertain the distribution of tuberculosis infection in a particular community or area. Type II is an extension of Type I survey to include incidence of morbidity and mortality from the disease. Type III proceeds to investigate into factors influencing infection, morbidity and mortality in the particular area or community. Type IV survey is to provide data for the assessing of the value of different anti-tuberculous measures and Type V is a survey with a limited object of investigating one or more particular problems connected with tuberculosis, *e.g.*, industrialisation and its effect on the incidence of tuberculosis, etc. The methods of making these surveys are described in detail. Charts, Cope Chat paramount card, key and explanatory notes to different types of survey are included in four appendices.

Type II survey obviously requires X-ray examination. It is stated in the pamphlet that mostly screen examinations will be done. When thinking in terms of hundreds or thousands of chest radiographs per day it is at once apparent that direct radiographic method on 15×12 film, which costs approximately 3s. per film (prewar) is quite out of the question. Screen examination is cheap and has been practised for a number of years but it has many disadvantages. Small initial infiltrations which are clearly seen on the roentgenogram may escape detection on the flouroscopic screen. Moreover after many hours of screening the radiologist's power of concentration and observation become dulled and may result in faulty diagnosis. Again there is lack of documentary evidence which inspite of notes and sketches, makes it difficult to call to mind the screen appearance after lapse of many days. In the opinion of some the satisfactory and speedy method of radiological examination of the chest is x-ray screen photography. Here the cost is about 1d per radiograph. In the second part it has been suggested to divide the lung area into six zones: upper, middle and lower zones in each lung, for the purpose of recording the anatomical extent of disease determined either by physical or x-ray examination. In America the National Tuberculosis Association suggested that the chest be (radiologically) "divided into three vertical zones extending outward from the lateral border of the spinal shadow to the lateral chest wall." This classification is based on anatomical and pathological considerations, and is followed by the radiologists. On the other hand for clinical purposes the surface of the thorax has been mapped out into different areas, fossae, and spaces by arbitrary lines and anatomical land marks. This has been taught to students from a long time. We do not see any reason to change these lung divisions. It is curious that there is no agreement between the advocates of horizontal zones regarding the extent of each zone.

To eradicate any communicable disease it is necessary to make a survey of the disease and tuberculosis is no exception. This has been done in every country of the West and it is quite natural that we should gain from the experience. According to a paper published elsewhere by one of the members of the sub-committee the death rate from tuberculosis in India is believed to be about 250 per 100,000 population and is almost the same for England in 1861-1865. It is also estimated that about 2 to 5 million persons are suffering from active tuberculosis for whom about 375,500 beds are necessary. We have only 2,700 beds. Basing on this calculation could not the country be equipped with the remaining beds at once while the survey is being made? Only the final mopping up can be left to be done on the results of the survey. Otherwise if we wait it will mean only delay. This becomes quite evident when we think that we are still living under the conditions of England of 80 years ago and have published a pamphlet on the methods of making a survey of this menace in the year of grace 1940.

B. P. NEOGY.

TAGORE BIRTHDAY SUPPLEMENT—The Calcutta Municipal Gazette. Edited by AMAL HOME. Price four Annas only.

Rabindranath Tagore completed his eightieth year on May 8, last. The attainment by the poet of the eightyfirst year of his life is an event of outstanding importance not only for Calcutta, his birth place, but also for the whole of India, our sacred motherland. In this number there is a chronicle of eighty years from 1861 to 1941. Tagore cannot be summed up for the extraordinary versatility of his genius branches out into practically every department of human culture. This has naturally made the task of his biographers exceedingly difficult. Having gone through the volume from the first page to the last and lingered over the numerous photographs, the reader is filled with a sense of awe and faith in the renaissance and destiny of our motherland. We humbly pay our homage to him and pray that he may live long amongst us.

This is a great compilation and we offer our sincere thanks to Mr. Home and we say to him, "well done". To lovers of Tagore's works it will be a useful guide but to many to whom he is not so familiar, this book will be an invaluable introduction. We wish we could present a copy of this volume to every member of the Indian Medical Association, but as the price of this number is only four annas, we hope no one will go without his own copy.

P.N.R.

TWELFTH HEALTH NUMBER—"The Calcutta Municipal Gazette."—Edited by AMAL HOME. Price -|8|- annas.

The achievement of a non-medical editor in publishing an annual health number, and maintaining the highest standard of excellence, deserves wide emulation in a country which is the home of many fatal diseases. Public education and civic consciousness can only be developed by such laudable efforts.

This number contains 168 pages of reading matter and over fifty original articles. To the busy medical practitioner, the articles on medical subjects and public health may not convey anything new but there are some aspects of our corporate life to which the doctor may pay a little more attention. "Development of Public Health in America" by W. G. Smillie, "Mending Men Mauled by Moloch" by St. Nihal Singh, "Public Health in the Soviet Union" by S. Upadhyay, "The Chinese Art of Eating" by Lin Yutang, "Mental Cleanliness" by Irene R. Ray, and "A Call from the Hills" by Erika Sorgay—to mention only a few—may be read by the doctor with pleasure and, what is more important, with profit.

Mr. Home has not only provided rich food for the mind but also a selected number of artistic pictures of great merit as a feast for the eyes. And all this for eight annas—we wish we knew Mr. Home's editorial secrets.

FRACTURES AND OTHER BONE AND JOINT INJURIES—By R. WATSON-JONES. Second Edition, 1941. Royal 8 vo. Pages xii+724. Illustrated. Published by E. & S. Livingstone, Edinburgh. Price 50 shillings net.

It is not surprising that the book on Fracture and other Bone and Joint Injuries by R. Watson-Jones went out of print within the first year of its publication. This, combined with some addition on casualty surgery, including treatment of infected fractures necessitated the publication of the second edition, which might otherwise have appeared as a reprint.

As a result of wide study and research carried out in different parts of the world in recent years the subject of treatment of bone and joint injuries has occupied more and more space—enquiry has branched out in more and more directions—meanwhile a wish has been expressed by the practitioner in the field, that a book should be issued in a practical and compendious form, to come within the range of a wider circle of readers.

This book written by one of the greatest authorities on the subject and based on the experience with and careful study of over 47,000 cases, answers this demand adequately. The book is not, however, a set of orders for surgical conduct but it does set a surgeon thinking since the main principle underlying the treatment of bone and joint injuries have been outlined so thoroughly and in such a masterly way.

Although maintaining a rather conservative attitude in the treatment of closed fractures it has strongly advocated operative interference "when necessary" as opposed to large volumes on the subject written by great thinkers in the past who have advocated either too much or too little surgery.

Much knoweldge on the subject of treatment of fractures both closed and open is expected to evolve as a result of experience with the present war—until then, and in any case for many years to come, this book will continue to remain the standard book on the subject of "bone and joint injuries" written in the English language.

The chapter on unusual and instructive cases as well as that on organization of fracture service is one of tremendous help to those who have much to do with the treatment of fractures.

The book is lavishly illustrated. Its presentation, printing, notes and references etc., are all excellent.

A. N. MUKERJI.